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AND

COAL

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RICHARD P. ROTHWELL, C.E., M.E., ROSSITER W. RAYMOND, Ph.D., M.E. } Editors.

Cable address: "Rothwell," New York.

Books for review, and all communications for the JOURNAL, should be addressed, Managing Editor, P.O. Box 1833, New York.

Communications for Mr. RAYMOND should be addressed to ROSSITER W. RAYMOND, P.O. Box 1465, New York. Articles written by Mr. RAYMOND will be signed thus *; and only for articles so signed is he responsible.

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THE space given to Mr. POTTER'S paper on the South Chicago Works obliges us to leave out this week the usual pages of Mr. HOWE'S "Metallurgy of Steel."

MICHIGAN, unrivaled in its copper and iron ore deposits, is coming forward as a gold producer. The interesting letter of one of our correspondents on another page gives all the available information concerning this important find. The Lake Superior Iron Company, on whose land the strike was made, writes us as follows:

"The free gold was struck at a depth of 18 feet and about a ton shot out by the blast. An average sample showed by analysis—gold, $43,662 27 silver, $317.90. Total, $43,980.17. This seam is reported about 8 inches; wide, but nothing is yet known of its extent. The vein is on Section 35, Township 48, Range 28, Marquette, Mich."

It is not, of course, to be expected that an "average sample" of even one ton thrown out at a shot will go any thing like this amount; but one per cent of this would be extremely rich ore. It must also be remembered that extremely rich ores are extremely scarce ores, and but little $44,000 rock need be expected, nor has experience shown these exceptionally rich specimen mines to be as profitable to work as those containing large bodies of low grade rock. Nevertheless, this remarkable find will create in Michigan a mining fever and attract to its orderly districts more of the rough element which always flies to a "booming camp," and of which the Gogebic boom has given a foretaste.

The discovery is an extremely important one, and, we trust, will lead to the finding and working of other profitable gold mines than the Ropes in this favored State.

ALFRED KRUPP.

This distinguished metallurgist and manufacturer died at his home in Essen, Prussia, on the 14th inst., aged 75 years. The great steel works at Essen were founded by FRIEDRICH KRUPP in 1810 as a small forge, employing only two workmen, and continued to grow under his management until the date of his death, in 1826, when ALFRED KRUPP, his son, was only 14 years old. From 1826 to 1848 the works were carried on by the widow and sons in company, ALFRED displaying a phenomenal aptitude for the business and remarkable executive ability. In 1848, ALFRED KRUPP, whose death is now announced, took entire charge of the works, and carried on the business under the firm name of FRIEDRICH KRUPP, and to him is due the credit for the establishment of these, the most extensive, and in some respects the finest works in the world.

The fame of Krupp guns, Krupp armor plate, Krupp rails, and many other things turned out on a mammoth scale at the great Essen works, have rendered the name of KRUPP a household word in every part of the world. Engineers are chiefly interested in the many improvements introduced by Herr KRUPP in the treatment of iron and steel. His were among the very earliest works to adopt the Bessemer process, and several dephosphorizing processes have long been used there. As, however, his works were very jealously closed against visitors, and a secret was made of nearly every thing about them, only general information was allowed to get into print. Mr. KRUPP was not only prompt in adopting every improvement in iron and steel making, but he rarely gave credit or reward to the inventor whose improvement he adopted.

The enormous extent of the Essen works may be appreciated from the following interesting figures with regard to the growth of the establishment which were published in 1884. In 1860 the Essen Foundry had only 1764 workmen, but that number had risen to 7084 ten years later, and it was in 1884 upward of 20,000. Counting the women and children, Herr KRUPP'S establishment gave employment in 1884 to 65,381 people, of whom 29,000 lived in houses belonging to their employer. The foundry was divided into eight sections, and there were 11 blast-furnaces, 1542 other furnaces, 439 steam-boilers, 82 steam-hammers, and 450 steam-engines representing 185,000 horse-power. At Essen alone, to say nothing of the branch establishments, there were nearly 40 miles of rails, 28 locomotives, 883 trucks, 69 horses, 191 wagons, 40 miles of telegraph wires, 35 telegraph stations, and 55 Morse instruments.

Since then large additions have been made to the works.

Herr KRUPP was a model employer; he built excellent houses for his officers and men, hospitals for the sick, established sick, burial and pension funds for his employés, and generally took the warmest interest in their welfare.

The importance of his services and his wealth induced Emperor William to offer him letters of nobility in 1864. They were, however, declined.

EDITORIAL CORRESPONDENCE.

SALT LAKE CITY, July 6, 1887.

The forty-eighth meeting of the Institute has at last begun, and under most favorable auspices. But before I narrate its commencement and forecast its continuance, I must bestow at least a passing mention upon the party that came from the East to enjoy the hospitality of the Salt Lake members and citizens.

If I were the Secretary of the Institute, I think I should have gone nearly distracted over the getting up of that party. Such a lot of people who sent in their names as intending to go! And such a lot of the lot as finally did not go! And such a harmonious and agreeable lot as did go, after all!

Our expected and "probably" promised fifty dwindled as the time approached, until at last we left Chicago only about twenty strong. We have now increased to somewhere near thirty. But the local members have turned out well; and our gathering at the opening session to-night was large enough to be called an audience.

So far as the pleasure of the journey was concerned, the numbers of the traveling party were just right for sociability and comfort. About one third being ladies, there was no lack of conversation and agreeable

company, while, at the same time, the duties of gallantry were not onerous.

The Fourth was spent at Manitou in visiting the Garden of the Gods and other notable scenes; and early the next morning, a swift special train conveyed the party to South Pueblo, where they inspected in succession the works of the Pueblo Smelting and Refining Company, the Colorado Coal and Iron Company, and the Colorado Smelting Company. The latter establishment attracted special admiration by its well-ordered arrangement and exceptional neatness, and by the taste which had governed the design of the offices, superintendent's house and grounds. It is not common to find at smelting works such an oasis of trees and grass and flowers as surrounds the residence of Mr. Eilers, the manager of this company, and the offices and laboratory in which his staff of assistants do their work. The arrangements for the health and comfort of the furnace men are equally noteworthy and still more praiseworthy.

Of the trip from Pueblo to Salt Lake by the Denver & Rio Grande route, what more could I say than that the Royal Gorge of the Arkansas was traversed by daylight, the Marshall Pass was crossed at about sunset, and the Black Cañon of the Gunnison was threaded under the lights and shadows of a full moon. No better conditions could be devised or dreamed for the most effective display of the sublimity and beauty of this wonderful route. Before the train reached Salt Lake City it was boarded by Messrs. Terhune, Walker, and others of the local committee, who gave us a foretaste of the cordial welcome we were to receive. A crowd of resident members and friends repeated this hearty greeting at the hotel headquarters; and it found full expression at this evening's session, in addresses from his Excellency, Caleb R. West, Governor of the Territory; Mr. W. S. McCormick, President of the Salt Lake Chamber of Commerce, and Mr. Richard H. Terhune, Chairman of the Local Committee. These speeches, together with replies by the President and Secretary of the Institute, occupied the whole of the session.

This morning was spent in visits to the Morgan and Germania smelting works in the Jordan Valley, and this afternoon in the fashionable Salt Lake amusement of bathing in the lake. There are two handsomely furnished establishments for this purpose at the Lake, controlled by the Union Pacific and Denver & Rio Grande roads respectively. The Institute patronized the former to-day and will revel in the other to-morrow. It is great fun, if it don't get into your eyes.

There is to be a banquet this evening, tendered by the citizens to the Institute, at the Walker House. To-morrow there will be sessions morning and afternoon, then an organ concert on the big Saints' organ in the Tabernacle, then, as aforesaid, an evening bath in the lake. Saturday will be spent in an excursion to Park City and the inspection of the Ontario mine and works. Sunday will be a day of rest, and on Monday morning the peripatetic portion of the meeting will start for Butte.

The papers on the list for the Salt Lake sessions are the following:

Gold and Silver Mining in Utah, by O. J. Hollister, Salt Lake City.

The Ontario Mine, by Thomas J. Almy, Park City, Utah.

Ore and Matte-Roasting in Utah, by R. H. Terhune, Salt Lake City.

Operations at the Old Telegraph Mine, by M. Lavagnino, Salt Lake City.

The Sulphur Deposits of Southern Utah, by A. Faber du Faur, Salt Lake City.

Uintahite, by Joseph M. Locke, Salt Lake City.

The Relations of Mining to Forestry, by B. E. Fernow, Washington, D. C.

It will be seen from the above list that the local members have done nobly, making amends for their comparative failure in times past to contribute to our Transactions.

Apart from the interest and pleasure accruing to all parties from such a meeting, the stimulus thus given to professional contributions is enough of itself to justify the policy of such gatherings at points remote from the geographical center of gravity of the Institute. For it must be remembered that the object of such *Wanderversammlungen*, as the Germans call them, is not so much to transport to distant points any considerable part of the membership as to keep alive the interest of resident members everywhere by giving them all in turn, so far as possible, the opportunity to participate in the social and professional pleasures of the meetings. In a word, we maintain a vigorous life in our widely-scattered body by following the good, old rule of keeping the extremities warm.

If the readers of the JOURNAL expect that I will follow this letter, which, to so large an extent, simply predicts what is going to happen here, by another one simply assuring them that it has happened, they are unreasonable. They will have the prophecy, and before they have received it it will become history, and may be read as such.

As to the text of the papers, that will doubtless be accessible in good time. Most of them, however, will be orally delivered, and prepared for publication afterwards. So you must have patience. If you want a more complete report than you are likely to get, it serves you right. You ought to have come along, and if I can, by the deficiencies of this hasty account, deepen the poignant regrets of any absentee, I shall have added the piquant flavor of delicate Christian malice to the pleasures of the occasion. For one likes, not only to be happier than other people, but also to have other people know it.

Perhaps a word or two of information will render this letter at home in the columns of the ENGINEERING AND MINING JOURNAL. Let us say, then, that the metallurgical practice of Utah is manifestly much improved. No better proof of that could be asked than the fact that the smelting works are largely occupied in treating the slags of their predecessors. Low-grade ores, concentrates and old dumps seem to be furnishing the main supply of raw material. The Ontario and Daly, both on the same vein, in Park City, send a considerable amount of smelting ore to the Morgan works. The Tintic and other southern ores are largely exported to Denver, Pueblo and Socorro. Bingham Cañon and Stockton furnish most of the material smelted at the Germania and Mingo, but the Little Cottonwood ores are beginning to come in. Here, as elsewhere, the pressure of hard times is developing skill and economy. The Horn Silver works are shut; at the mine, expenses are paid by gleaning of ore, and prospecting is going on.

*

THE SOUTH CHICAGO WORKS AND THOSE WHO HAVE MADE THEM.

The reading before the British Iron and Steel Institute of Mr. POTTER'S paper on the South Chicago Works, following as it did a very able paper by Mr. F. W. GORDON, read before the same society some time ago, has opened the eyes of many British iron masters to the wonderful progress made in this country in iron metallurgy. A few years ago American engineers surprised their European confrères by their marvelous improvements in steel making, and have since been recognized the world over as the masters in that art. This position has been strengthened and confirmed by Mr. HOWE'S magnificent treatise on the Metallurgy of Steel now in course of publication in the ENGINEERING AND MINING JOURNAL, and for the right of translation of which eminent German and Austrian engineers have applied. In blast-furnace practice our progress was slower, but in that also our records of recent years have been unequaled in any other part of the world, and yet this fact appears to have fallen like a revelation on many of the English iron masters, who, so long pre-eminent in this branch of metallurgy, are naturally reluctant to admit that they have now been distanced. The admission from the veteran Sir ISAAC LOWTHIAN BELL, in closing the discussion, that "when he (Mr. POTTER) makes a statement in the manner he has done to me, and in the manner in which he does in this paper, it requires one to examine his statements with very great care, and consider whether he may not be right and I may be wrong" is certainly the most that could be expected, and it does great credit to this Nestor of the art of iron making.

We also desire to do honor to the men who have brought this branch of metallurgy up to this position of supremacy. Without forgetting the merits of many other distinguished American engineers, whose intelligence and labors have aided in bringing this art to such high perfection, we think it appropriate that our readers should make, as it were, personal acquaintance with the gentlemen who have done the great work recorded in Mr. POTTER'S paper.

ORRIN W. POTTER, President of the North Chicago Rolling Mill Company, was born in Rochester, in 1836. He received a common school education, and at fifteen years of age was engaged in the survey of certain railroads in his native State, and later in the preliminary survey of the Great Western Railway of Canada. In 1856, he entered the employ of Capt. E. B. WARD, at his iron rail mills at Wyandotte, Mich., as clerk. When Capt. WARD built his mill in Chicago, Mr. POTTER was appointed as paymaster in 1857. In 1860, he became superintendent, and in 1864, when the mill was merged in the corporation known as the Chicago Rolling Mill Company, he was appointed secretary and general superintendent. In 1871, on the retirement of Capt. STEPHEN CLEMENT, he was elected president of the company, which position he has since continuously held. Mr. POTTER has, therefore, been connected with the corporation, of which he is the head, since its incipiency, and its subsequent growth and prosperity are due more to his able and sagacious management than to any other thing. Originating with a mill for re-rolling iron rails, with a capacity for rolling 15,000 tons per annum, it has expanded so as to comprise three great works, employing 5000 men, with a combined total capacity of 900,000 tons of material per annum.

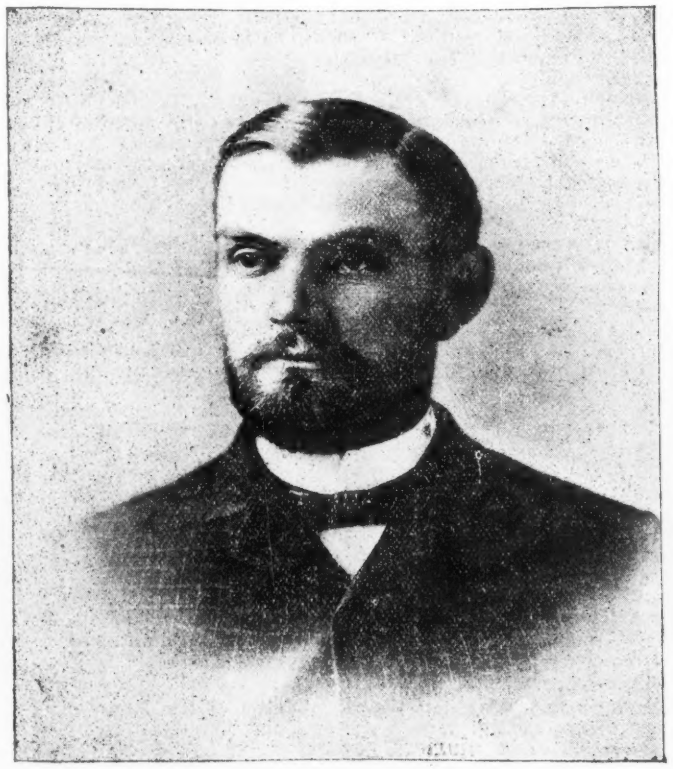
EDWARD C. POTTER, General Superintendent of the South Chicago Works of the North Chicago Rolling Mill Company, son of O. W. POTTER, was born in Chicago in 1860. He was educated in the public schools and high school and in the Massachusetts Institute of Technology, where he took the course in mining and metallurgical engineering. At the close of his school career in 1879, he entered the employ of the North Chicago Rolling Mill Company as chemist. When the new works at South Chicago were determined upon, he was appointed super-

intendent in 1880, when the work of building was begun, and this position he has since continuously held.

The pages of the ENGINEERING AND MINING JOURNAL have borne frequent testimony in the eloquent language of figures of work accomplished, of the ability and skill of this young American engineer. The paper which he has just read before the British Iron and Steel Institute, and which is published on another page has brought him the extremely complimentary indorsement of the ablest of the English iron masters. We hope our pages may long continue to record new his triumphs.

ORRIN W. POTTER,

PRESIDENT NORTH CHICAGO ROLLING MILL CO.



EDWARD C. POTTER,

SUPERINTENDENT SOUTH CHICAGO WORKS.

HENRY C. KRIETE,

CHIEF ENGINEER NORTH CHICAGO ROLLING MILL CO.

HENRY C. KRIETE, Chief Engineer of the North Chicago Rolling Mill Company, was born in the kingdom of Hanover in 1837. He emigrated to America with his parents in 1847, and settled in Chicago. Here he received a common school education, devoting special attention to mathematics and drawing. He learned the trade of machinist and eventually rose to the position of foreman of the shop. In 1859 he was employed as master mechanic at Captain WARD'S rolling mill, holding this position until 1866, when he was given the position of draughtsman. In 1871 he was appointed chief engineer, and under his direction the rapidly growing concern was designed and constructed. The new works of the company at South Chicago, built in 1880–82, were designed by him, as well as almost every piece of machinery in them, and they may well be considered as his masterpiece, and a worthy monument to his remarkable skill. Mr. KRIETE is a recognized authority on rolling mill engineering; he combines in rare degree originality, fertility in resources, and that sound judgment which is the balance wheel of the successful nventor and mechanic.

THE BELCHER AND SLIDE MINES, BOULDER CO., COLORADO.

Correspondence of the Engineering and Mining Journal.

In the JOURNAL of the 2d inst., under the head of General Mining News, you say of the Belcher: "This mine at Caribou, which has been worked under lease and bond to Irwin Brothers, has been sold to Mr. Godfrey, of New York, for $100,000. The mine is said to be now and has been in good pay for some length of time."

About a year ago the Belcher was leased and bonded to Irwin Brothers for $10,000; shortly after beginning work they struck a good body of rich ore, from which they quickly realized enough to pay for the mine, and from which they have derived a handsome income ever since. It is now stated on excellent authority that the mine is in better pay than ever before and is "worth the price asked for it."

The Irwin Brothers having shown the value of the property, bonded it to Mr. Godfrey, of St. Louis (not New York), and placed a deed in escrow in the First National Bank of Boulder. The purchase money was to have been paid on or before July 1st, 1887. On the first of July, Mr. Godfrey asked for and obtained an extension of thirty days.

I mention the matter simply because I know how desirous you are of being perfectly accurate in your statements.

In the JOURNAL of June 25th, you refer to the sale of the Slide mine in London for $2,000,000. There is not a mine in Boulder County worth one quarter the amount named; and if I were called upon to name the mines in order of value, the Slide would appear a good way down in the list.

Who is the George W. Cummings who is said to have made a report on the Slide? I know one man of the name who is connected with mining operations, and his reputation leaves much to be desired.

Le Neve Foster's report, it is rumored here, was made for a contingent fee.

Your course in connection with the Security swindle will commend itself to every honest man who knows the facts.

I will try to send a letter to the JOURNAL shortly, even if this is rather a dry place for news. NIX.

DENVER, July 7, 1887.

THE GREAT GOLD FIND IN MICHIGAN.

Correspondence of the Engineering and Mining Journal.

Among mining men the discovery of gold made on the Lake Superior workings last week is the principal talk this week. The discovery was kept quiet until Saturday, when specimens of the find were placed on exhibition at the Ishpeming National Bank, Lake Superior Iron Company's local office, and the *Iron Ore* office. They were seen by hundreds, and were pronounced to be the richest gold specimens ever taken from any mine.

The location of the property on which the gold was found is about six miles from Ishpeming, on the N. E. quarter of the N. W. quarter of section 35, town 48, range 28. Gold was originally found there on June 14th, 1885, by W. L. Jones, A. B. Miner, J. E. Jopling, and E. R. Hall, of this city. Quite a rich seam of auriferous quartzite was found at a depth of less than four feet from the surface. The four original discoverers kept their secret for two months, during which time they labored unavailingly to secure a lease from the owner of the land. In August, when their discovery was made public, many visited the place and the find was pronounced a rich one. The adjoining 40 acres of land, owned by Peter Gingrass, had been leased in the preceding spring by Jos. C. Foley, of Tower, Minn., then a resident of Ishpeming. The terms of the lease were that a certain amount of exploring for gold must be done to validate the lease. Some desultory work was done, and then Foley stopped exploring. When the excitement came in August Peter White, of Marquette, secured a second lease of the property from Gingrass: but before he could do any work, Foley began legal proceedings against White and Gingrass for the property. The Lake Superior Company would do no exploring, and neither White, Gingrass nor Foley could do any, so public interest waned. Last June, by order of the directors, Mr. C. H. Holl, superintendent of the Lake Superior Iron Company set a few men at work on the property. At a depth of 20 feet they discovered the rich ground which has created such an excitement. Assays of average specimens show that the rich rock runs over $10,000 to the ton in native gold, while picked specimens give five times that.

The gold is so thick that it holds a mass of quartz together after it has been broken by a hammer. Of course, there is only a comparatively small amount of this very rich rock. It was found in the shape of a "chimney" beginning at the hanging and now on the foot wall at a depth of 22 feet from surface. Work was stopped Saturday of last week for the erection of a building to hold the ore. The men will probably be set to work again to-day or to-morrow. The eyes of mining men will be centered upon it from this time forth.

The gold bearing belt seems to extend in a fairly defined line from Marquette to L'Anse, some 60 miles, and is from 2 to 8 miles north of the iron belt. Marquette has had both gold and iron mines, but neither have proved valuable. Marquette streets are now macadamized with the rock taken from "Johnny Spear's gold mine," and iron stock in the Marquette mines is hardly at par. The nearest iron mine to L'Anse is the Taylor, only 10 miles from L'Anse and 34 miles from Marquette by rail.

The gold formation is known to exist in the Huron Mountains, a low range of hills to the east of L'Anse. Here it was, tradition says, that Dr. Douglass Houghton, the pioneer geologist and mineralogist of the upper peninsula, filled a goose quill with pure gold only a few days before his tragic death while attempting to cross Keweenaw bay in a storm. Indian traditions point to the vicinity of the Huron Mountains as the place where gold exists in great quantities. Indian traditions, however, are not so reliable as they might be, but they are entitled to consideration on the part of men who are hunting for gold. A little exploring has been done in the Huron Mountains, but not enough to give any true idea of what there may be there.

A. A. Anderson, who has done a great deal of exploring within the past 15 years, has secured a lease of the 40 acres adjoining the Gingrass tract, and will explore for gold. Peter White and J. C. Foley will probably go to law again to settle their claim to the Gingrass "forty." The gold fever, which has been extinct for a year, is again epidemic. There is undoubtedly gold in great quantities in this peninsula, and continued exploration will certainly prove this, and open good mines.

At the Ropes mine, a number of changes have been made in the mill. There is no reason why the Ropes mine can not mine and mill its rock at a profit of at least $1 a ton. Western mines are milling much poorer rock, and making handsome profits. The mine is looking well.

It is a fact not generally known that $3,500,000 worth of silver has been produced from Upper Peninsula mines. The Silver Islet mine, on a small island of the same name in Lake Superior, was the only mine which has produced silver alone at any great profit, but a number of the copper mines, especially the Moss mines of the Ontonagon District, have produced many thousand dollars worth of silver, in addition to the copper product. The Iron River silver property in Ontonagon County is now being tested by Chicago parties.

North of Ishpeming about eight miles is the old Holyoke silver-lead property. This was worked some twenty years ago. Old miners claim that it could be worked at a profit under careful management. The old Holyoke contains a good vein of galena, carrying silver in considerable quantities. Explorers have found galena in the vicinity of the old Holyoke, which has shown the probability that there is a considerable vein of lead ore somewhere between Ishpeming and Lake Superior. The upper peninsula of Michigan no longer numbers iron and copper alone as her mineral wealth. H. S.

ISHPEMING, Mich., July 15.

BUTTE, MONTANA NOTES.

Correspondence of the Engineering and Mining Journal.

I learn on excellent authority that the Alice has not made any money for some time; the ore is said to be running very low, not exceeding $25 a ton in value.

The Lexington has been pretty hard up for ore for a long time, and they are working custom ores from different mines in the camp.

I have not heard what has been found in the 1000 foot level, they appear to be quite indisposed to give any information.

The Moulton is running along about as usual, purchasing a part of its supply from different mines as custom ores. The action of the Lexington and Moulton in this respect has had a very advantageous effect upon the district in encouraging the development of prospects. The Moulton Company is now starting in to open up the Poser. The reserves of the best ore above the 500-foot level in the Moulton have been pretty well exhausted, and they have driven west on the 700-foot level about 700 feet. At the point where the vein was cut some very rich ore was found, but it did not seem to go up; it is said to be very strong in the bottom, and the company proposes to cross-cut the west drift in different places with the hope of finding ore. If a good body of ore is found on this level, they will have 200 feet above it.

The copper mines are running along about as usual. The Parrot has cut the vein on the 600 foot level, and has found it strong, not exceedingly high in copper, although it seems to carry more silver in proportion to copper than it did above. This will give them 200 feet of virgin ground. I regard the prospects of the company favorably. This company cleared a large amount of money last year, notwithstanding the low prices of copper and silver. The Montana Copper Company's property is idle, as is also Clark's Colusa.

Several reasons are given for closing this mine, but the proprietor claims to have about 15,000 tons of ore in the dump that he wishes to work up, as it has been lying there some three years, and is deteriorating all the time. Mr. Clark is also opening up the Mountain Chief mine a hundred feet deeper, and is also working the Original. Both of these are copper silver properties. Mr. Clark claims that he will not need to extract any more copper ore to keep his works going until the beginning of next year.

The Anaconda Company are shipping about 1200 tons daily to their works. They have recently begun the erection of another smelting plant near the new concentrator. It is stated that their smelting capacity is deficient. I presume their ore will carry from 6 to 8 per cent copper. They are putting 50,000 feet of lumber daily into the mine. They are likewise running Burleigh drills in the country rock in order to fill their works. I understand that the Mountain View and Montana Copper Company have some hope of selling to the Lake Superior people.

The output of the several copper mines this year will be probably about as follows: The Parrot, 1,000,000 pounds per month; Clark's Colusa, 600,000 pounds per month (making altogether argentiferous matte). The Anaconda Company are producing probably 3600 tons monthly of 60 per cent matte. QUI.

BUTTE CITY, July 5, 1887.

Since the above was written, the consolidation of the Mountain View and Montana companies' properties is announced authoritatively.—EDITOR ENGINEERING AND MINING JOURNAL.

Production of Gold in Russia.—The value of the gold raised from the Russian soil in 1886 was computed at 25,736,000 roubles, as compared with 30,869,000 roubles in 1885, 32,084,000 roubles in 1884, 24,523,000 roubles in 1883, and 16,910,000 roubles in 1882.

A British government blue-book has been issued, containing detailed reports relating to the ownership in minerals and mining rents and royalties in France, Germany, Austria-Hungary, Italy, Belgium, Portugal, Spain, Sweden and Norway, and the United States.

Water Power from Artesian Wells.—Many artesian wells spout water under a heavy pressure, just as many gas wells find the gas under a pressure of several hundred pounds to the square inch. This water power is used in many places in France, by means of turbine wheels, and it is probable that even the gas pressure might in some cases also be utilized. In very deep artesian wells, the heat of the water is also utilized, as at Grenelle, in Paris, France.

THE SOUTH CHICAGO WORKS OF THE NORTH CHICAGO ROLLING MILL CO.*

By Mr. E. C. Potter.

The South Chicago Works of the North Chicago Rolling Mill Company are situated in the town of South Chicago, 12 miles south of the city of Chicago, at the mouth of the Calumet River, where it empties into Lake Michigan. The grounds occupied by the works comprises nearly 100 acres, measuring about 3000 feet on the shore of the lake and about as much on the river, which runs into the lake nearly at a right angle. This location is particularly well adapted for such a plant, inasmuch as it has excellent water facilities for the transportation of ore, all of which is received by water from the Lake Superior district, and the very best railway communications, the company having no less than six railways in direct connection with its own yard, and one of them, the Belt Line, having direct connection with each one of the 30 railways entering Chicago. The plant was built for the manufacture of steel exclusively, and consist of four blast-furnaces, a Bessemer works, and a rail mill. Built in the years 1880–82, they were designed to embody all improvement in arrangement and machinery for the accomplishment of the maximum of output with the minimum of cost.

BLAST-FURNACE DEPARTMENT.

The four furnaces stand in a row facing east toward Lake Michigan, some 1000 feet distant, into which a large share of the furnace slag is dumped. During the week the iron from those furnaces is transferred direct in the molten state to the Bessemer department, the spouts for conducting the iron to the ladles being situated near the cinder fall on the sides of the casting beds. The Sunday make is cast into pigs, for which purpose large roofed casting houses are provided. The coke is all under roof in a large stock-house in rear of the furnaces, capable of holding 4000 tons. The ore and limestone is all stored in the open air. The furnaces are worked in pairs, one elevator sufficing for two furnaces, each cage holding four buggies. In consequence, one gang of fillers and cage men suffices for two furnaces. Each furnace is supported by three Whitwell stoves measuring 21 feet diameter and 60 feet high, and the escaping gases from these 12 stoves are carried off by means of a chimney 190 feet high with 12 feet clear diameter. The blast is supplied by eight blowing engines, two for a furnace, each of 54-inch stroke. 36-inch steam cylinder, 84-inch air cylinder, with a maximum speed of 40 revolutions or 12,500 cubic feet air per minute;

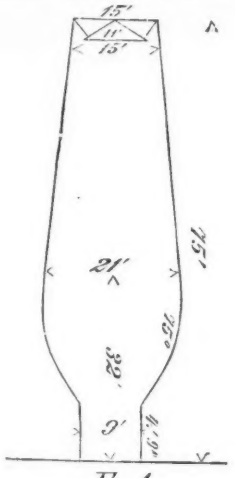


Fig. 1.

LINES OF ORIGINAL FURNACES.

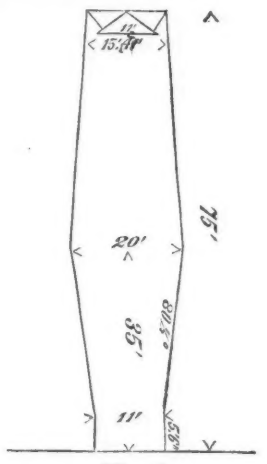


Fig. 2.

LINES OF NEW FURNACES.

two engines thus supplying a furnace with a maximum of 25,000 feet per minute. The steam for these engines is supplied by a battery of 72 boilers, 48 inches diameter, 36 feet long, so arranged by placing two boilers end to end that the flame passes under a total length of 72 feet. The waste gases of the furnaces are used for making steam, and are then conducted off by a chimney 175 feet high and 15 feet clear diameter. The furnaces are numbered consequently Nos. 5, 6, 7 and 8, the company owning four more furnaces in other localities. They are each 75 feet in height, and as originally lined were 21 feet diameter at the boshes, 9 feet diameter of bell. The bosh line was 32 feet above the floor, the tuyere line 4 feet 9 inches above the floor. The angle of the boshes was about 76 degrees. No. 5 furnace was blown in the first time on March 26th, 1881, just a year from the time the ground was broken for the foundation. The manager who at that time had charge of the furnace succeeded in getting what was then considered good average work out of thefurnace, making about 1000 tons per week on a coke consumption of about 2800 pounds per ton of iron. No. 6 followed on August 9th, doing about the same work. The furnaces were then running their iron into the pig beds, as the steel works were not completed. No. 7 was blown in March 11th, 1882, and the steel works started June 8th, 1882, when direct metal was first used. By this time No. 5 was over a year old, and was beginning to give decided indications of wear. The product had fallen off to an average of 900 tons per week, while the coke consumption was certainly not reduced. The grade of iron as well became more irregular, and the changes from hot to cold became more frequent. As the blast proceeded these changes became more and more frequent, and finally the furnace seemed to work altogether by slips, a slip occurring about once in 24 hours. To make a long story short, the furnace finally succumbed to the inevitable, and was blown out after a blast of two years and four months' duration, with a total product of 99,850 gross tons. The performance of the other three furnaces was almost an exact repetition of this one, the greatest length of blast in any one of them being two years seven months. The furnaces were all very badly worn below the bosh line, while the hearth was entirely gone, the iron penetrating as far as the foundation stone, and spreading out under the columns, even under the pig bed. Enormous "salamanders" were taken out of each furnace. An examination of the original lines of the furnace will, I think, reveal the cause of many of the difficulties experienced. The small diameter of the hearth as compared with the great diameter of the bosh, gave a very flat angle of bosh line. An excessive thickness of wall resulted, with no means provided for cooling or maintaining it. In consequence, this mass of brick soon yielded to the heat and attrition of stock, and was all burned away down to the tuyere arch blocks. These, being water cooled, maintained the brick work around them, thus forming a projecting shoulder, upon which the stock lodged until it formed a ledge, which finally fell of its own weight, precipitating a large amount of cold material into the hearth. This, of course, caused the furnace to work cold until this material was fused, when it would work hot until the next avalanche. These occurred with considerable regularity about every 24 hours. In relining these furnaces, an attempt was made to obviate these difficulties, with what success we shall see further on. The main points considered were greater regularity of working, larger output, and lower fuel consumption. The lines finally decided upon were those furnished by Mr. Fred. W. Gordon, being duplicates of the Isabella furnace, of Pittsburg, a furnace already famous in America for general excellence. In the new form the diameter of bosh is reduced to 20 feet and the bosh line raised 3 feet, making 35 feet from the floor. The hearth is enlarged to 11 feet, and the tuyeres raised to 5 feet 6 inches above the floor. This gives a bosh angle of 80½ degrees. The same bell was retained, but the tunnel head was enlarged to 15 feet 4 inches, making a space of 26 inches between the rim of the bell and the furnace wall. This seems to be about the proper space for the accomplishment of an even and equal distribution of stock. The bosh wall from the hearth to the bosh line is 32 inches thick as against 7½ feet in the old form. A comparatively new method of cooling and maintaining this wall consists in a series of water cooled plates inserted in the brickwork extended to within 5 inches of the inner wall. There are three sets of these, the first being 2 feet 8 inches above the tuyeres, the second 3 feet 4 inches above the first, and the third 3 feet 5 inches above the second. Each set consists of six plates, forming a complete circle. Each plate has two pipes cast in it, through which water is kept constantly running; the plates are connected in pairs, the water passing through the pipes of both before being discharged. The plates can be readily removed and new ones inserted, in case of burning out or stopping up of pipes. I think I may take this opportunity to testify as to the excellent and efficient manner in which these plates perform their work. We have never lost one on our furnaces from any cause, and their efficiency in maintaining the furnace wall may be shown in the fact that after 22 months' blast, in which 100,000 tons of iron were produced, the average wear shown from nine measurements was 5 inches and the greatest wear in any one spot was 10 inches. The water in passing through these plates is raised in temperature about 6 degrees C. or 10 degrees F. Furnace No. 5 was blown in for her second blast on March 22d, 1884. In the month of April she made 6500 tons of iron; in May, 5000 tons; in June, 5063 tons; in July, 5051 tons. In the matter of product, the new furnace was certainly a success; as regards regular working and uniformity of product, nothing better could have been desired; but the improvement in coke consumption was not what was expected, it being about 2650 pounds to the ton of iron. In August, 1884, No. 6, having been remodeled, was blown in, and at the same time experiments in the burdening of the furnaces were begun, looking to better economy in fuel. These were so far successful that the coke consumption in No. 5 for the month of August was 2398 pounds per ton of iron. For the month of September it reached 2346 pounds, and the month of October 2230 pounds, a little less than pound for pound. During this time the product still kept up to the standard both in amount and quality. In the month of November furnaces 5 and 6 were banked owing to dullness of trade, and furnaces 7 and 8, still retaining their old form, were blown out. During the winter No. 7 was remodeled. Furnaces 5 and 6 began blowing again on February 7th, after an idleness of 70 days. They were both rather badly chilled in the hearth, and it was two months before they were in good running order again. On March 30th, 1885, No. 7 was blown in again on the new lines, and the experiment in burdening, dropped in November, was again renewed. Inasmuch as No. 7 began her second blast under all the new conditions, we will take her performance as the basis for subsequent calculations and remarks. Appended in tabulated form is the work of this furnace, each month up to January, 1886.

	Tons iron.	Pounds coke per ton.
April	5 167	2,622
May	6,097	2,182
June	5,892	2,190
July	6,075	2,012
August	5,978	1,875
September	6,488	1 897
October	5,9×9	1,941
November	6,242	1,877
December	5,9.6	1,892
Nine months 1885	52,927	2,034

For the last six months of 1885 this furnace made 36,689 tons of iron, with an average coke consumption of 1,912 pounds to the ton of iron. Let us now examine the method by which this great improvement was brought about. Previous to August, 1884, the furnaces were carrying a burden composed of about 9500 pounds of ore, 3300 pounds of lime, and about 6400 pounds of coke; the ore was all from Lake Superior, yielding in the furnace an average of 62½ per cent metallic iron. It is apparent that our proportion of lime to ore was much too high, being about 35 per cent. While we were at that time obtaining large and regular product, it was accomplished by hard driving and great waste of fuel. We were blowing pretty steadily from 22,000 to 25,000 cubic feet of air per minute into each furnace. This taxed our blowing engines to the utmost, while the consumption of steam was enormous, threatening even to exceed the capacity of our immense battery of boilers. The

* Paper read before the British Iron and Steel Institute.

stoves were not equal to the requirements of heating such a volume of air per minute, and it was with difficulty that the blast heat of 1200 degrees was maintained. The gases escaping from the tuunel-head were very hot and rich in CO, their temperature being about 900 degrees Fahr., and the ratio CO to CO_2 being about 0·25 per cent. A reduction in the amount of lime was decided upon and begun forthwith. It immediately began to make itself felt in the shape of lower fuel consumption. Thus encouraged, the reduction was continued, each reduction in lime being marked by a reduction in fuel, in volume of blast, and in temperature of escaping gases. It was then determined, in view of such satisfactory progress, to carry the reduction to the lowest notch, and determine the ultimate fuel economy. In twelve months from the first experiment the lime was reduced from 35 per cent of the ore to 13 per cent of the ore; and with what results? The volume of air blown was reduced from 25,000 cubic feet to 16,000 cubic feet per minute; the blast heats could easily be maintained at 1400 degrees Fahr.: the temperature of escaping gases fell from 900 degrees to 300 degrees Fahr.; the ratio CO : CO_2 increased from ·25 per cent to ·47 per cent: the product of the furnace increased to 1350 or 1400 tons per week, and the coke consumption fell from 2650 pounds to less than 1900 pounds per ton of iron. But another difficulty arose to counterbalance these successes. The sulphur in the iron increased to such an amount as to render it almost unfit for steel making purposes. We had carried the lime to so low a point that there was not enough to remove the excess of sulphur. It then became necessary to ascertain to what extent the lime could be increased sufficiently to remove the sulphur and still maintain the economy in fuel. The lime was accordingly very gradually increased to about 18 per cent—20 per cent of the ore burden—which brought the sulphur in the iron to within ·05 per cent on normal grades of Bessemer iron, without effecting any change for the worse in fuel economy. Indeed, the fuel ran somewhat lower under this treatment.

The burden of No. 7 furnace at this time was as follows:

	Pounds.		Pounds.
Cambria hematite	1,100	Superior hematite	2,000
Chapin hematite	2,200		
Cleveland specular	1,100	Weight of ore	13,200
Cleveland hematite	1,120	Limestone	1,950
Colby hematite	2,200	Coke	6,500
Norrie hematite	2,200		
Superior specular	1,100	Total burden	21,650

The analysis of materials composing this burden is as follows:

	Met. iron.	Silica.	Phos.	Alum.	Lime	Mag.
Hematite:						
Cambria	62·88	6·40	0·03	2·68	0·36	0·04
Chapin	63·24	3 70	0·07	1·43	1·87	2·06
Cleveland	60 37	6·54	0·05	3 63	0·58	0·20
Colby	58 61	3 89	0 05	....	....	....
Norrie	63·57	4 09	0·06	1·38	0·71	0 17
Superior	62·36	4·33	0 06	....	....	....
Specular:						
Cleveland	65·03	4·22	0·11	1·65	0 41	0·18
Superior	64·55	4·26	0·08	2·61	0·50	0 40

NOTE.—Colby hematite contains also 4·42 per cent manganese.

Analysis of Illinois limestone: Silica, 0·84 per cent: alumina and iron, 2·04 per cent; carbonate of lime, 29·85 per cent; carbonate of magnesia, 22·87 per cent; phosphorus, 0·01 per cent.

Analysis of Connellsville coke: (Average) ash, 10·50 per cent; sulphur, 0·90 per cent; fixed carbon (by difference), 88·60 per cent.

The iron resulting will average the following chemical composition: Silicon, 1·75 per cent to 2·25 per cent; phosphorus, 0·10 per cent; sulphur, 0·05 per cent; combined carbon, 0·50 per cent; graphitic carbon, 3·50 per cent. The average slag has the following composition: Silica, 28·50 per cent; lime, 28·50 per cent; magnesia, 22 per cent; alumina and iron, 20 per cent. The gases escaping from the tunnel-head have a temperature of about 300 degrees F., and have the following average composition: CO, 25·50 per cent; CO_2, 12 per cent; CO:CO_2, 0·47 per cent.

Mr. Gordon in his paper on "American Blast Furnace Practice," ENGINEERING AND MINING JOURNAL, Nov. 14th, 1885, gives tables showing results obtained with our furnaces, and comparisons made between them and some of the great English furnaces. As the figures from which Mr. Gordon prepared these tables were furnished by myself, it will be unnecessary for me to repeat them here. I have shown you how a plant of four furnaces which originally yielded 3500 tons of iron per week was made to yield 5500 tons of iron per week without a dollar expended in increase of engines, boilers, stoves, or any part of the plant, simply by changing the interior lines of the furnace, which in fact reduced its cubical contents, and by a marked change in the system of burdening. This means that if the four furnaces had been left as originally built and operated, we would have had to build two more furnaces of the same size, with additional engines, boilers, stoves, hoists and buildings to produce the same amount of iron we have succeeded in producing with the original plant under the new *régime*. I think, therefore, I may safely say that the furnaces at South Chicago produce more iron per dollar invested in plant than any other furnace plant in the world. In this connection I would like to say a word as regards the "rapid" furnace practice of the Americans. It has been said of our furnaces that "they lead a short life but a merry one." This is literally true, and up to a certain point I regard it as the truest economy. Our furnaces will go two years and a half on one lining, and in that time will make 150,000 tons of iron. The time required for re-lining is 60 days, and the cost of re-lining, in round numbers, $15,000, or ten cents per ton on the total make of the furnace for the blast. In the absence of any accurate data on the subject, I will assume that an English furnace of like capacity will make 45,000 tons of iron a year, and will run an average of seven and a half years, making in the blast, say, 340,000 tons. In the same length of time, with two re-linings, the American furnace would have made 450,000 tons, or nearly 33 per cent more with the same plant, and an additional expense of ten cents per ton on the cost of iron. In short, two American furnaces would do nearly the same work as three English furnaces of the same size, or, to illustrate further, it would require six English furnaces of 15,000 cubic feet internal capacity to furnish the same amount of iron to our steel works that our four furnaces do. The furnace plant at South Chicago cost in round numbers $750,000. If two additional furnaces had been necessary the cost would have been $1,100,000, an increase in cost of plant of $350,000. The interest on this extra investment for two years and a half, or one blast of a furnace, at 6 per cent, is $52,500, while the additional expense incurred by reason of re-lining every two and a half years is $15,000. The difference in favor of the "short and merry life" would therefore appear to be $37,500 every two and a half years. Looking at the matter from another standpoint, we will suppose the English furnace of 15,000 cubic feet internal capacity can make 45,000 tons of iron per year, and during a blast of seven and a half years will make 340,000 tons. By operating this furnace on the American system, one third more iron could be made with the same furnace with but an additional expense of two furnace linings, which would cost in America $30,000, or £6000 sterling. It would seem to me that this is a very cheap way of increasing the product of a furnace plant, to say nothing of the value of the additional 110,000 tons of iron which would be obtained, and the profits on the same. Another prominent feature in favor of large product is the cost of labor per ton of iron. In America, where high wages is the rule, it is a necessity to economize by making more iron per man.

The furnaces at south Chicago are worked in pairs, and the following is the quota of men for one pair of furnaces:

	Per day	
2 foremen	$4 00	$8 00
1 assistant foreman	3.00	3 00
4 keepers	3.10	12 40
4 helpers	2.45	10.80
12 helpers	2.30	27.60
2 stovemen	2 30	4 60
4 cindermen	2.20	8.80
8 cindermen	2 00	16.00
4 cagemen	2.00	8 00
4 cagemen	1.80	7.20
8 top fillers	2 25	18.00
8 top fillers	2.00	16.00
58 bottom fillers	2.00	116.00
1 clay mixer	1.65	1.65
4 locomotive engineers	2.50	10.00
4 switchmen	2.00	8.00
½ engineer	4.00	2.00
1 engineer	3.25	3 25
1 engineer	3 00	3.00
1 engineer	2.75	2.75
1 pumpman	2 75	2.75
1 water tender	2 65	2 65
2 greasers	2.00	4.00
136½		$295.45

This shows 136½ men directly engaged in the production of iron, at a daily cost of $295.45. This would make a product of 2¼ tons per man, at a cost of 84½ cents per ton for labor. The incidental labor, such as masons, machinists, blacksmiths, laborers, cinder dump men, etc., etc., will cost about 30 cents more per ton, making the total cost of labor per ton of iron produced about $1.15. We have done better than this at times, but this is a fair average. The largest item of labor, viz., bottom fillers, is made necessary by reason of the fact that we have to put in a heavy stock of ore to carry us through the six months when navigation is closed on the lakes, thus necessitating a very large stockyard, and a correspondingly long haul from the ore pile to the hoists. Thirty-three cents per ton, or nearly one third of the entire labor cost, is expended in this work.

NOTE.—Since this paper was written, furnaces 5 and 6 have both been blown out, the first after a blast of 938 days, the second after a blast of 880 days. Both furnaces were banked down twice during the blast, once for 70 days, and again for 40 days, and both times they were badly chilled. This of course shortened their life very materially. The output of No. 5 for the blast was 133,793 tons, made in the actual running time of 798 days, giving an average coke consumption of 2223 pounds per ton of iron. No. 6 made 131,565 tons during 750 days actual running time, giving an average daily product of 175·4 tons. The average coke consumption for the blast was 2116 pounds per ton of iron.

THE BESSEMER DEPARTMENT.

There are three converters of nominally 10-ton capacity, though 12 and 13 tons are more frequently treated. The converters are in a row facing east, and blow directly into the atmosphere without chimneys. North of the converters are four cupolas for melting spiegel, and south of them in a separate building at the top of the direct metal incline are two cupolas of 10 feet diameter for melting the Sunday make of pig-iron. These cupolas may be considered as auxiliary to the blast-furnaces. The pit in the converting-house is 50 feet diameter, capable of containing three sets of ten molds each. Four 8-ton top-supported hydraulic cranes are situated about the pit at equal distances apart. Between the converters are two 15-ton receiving-cranes, so situated that each crane commands two converters. The center casting-crane is a duplicate of these. They are supplied with a horizontal hydraulic ram for moving the ladle in and out along the jib. The metal is poured from the converter into a ladle carried on one of the receiving-cranes, which is then swung around to a short stationary track into which the jib of the receiving-crane fits on one end and the jib of the casting-crane on the other end. The ladle of steel is pushed from the receiving-crane to this stationary track and uncoupled, and then it is seized by the ram of the casting-crane, pulled on to its jib, and swung around over the molds, the whole operation occupying less time than it takes to describe it. In the rear of the converting-house is the repair-shop, where ladles and bottoms are lined, patched, and dried. The north end of the building is devoted to bottom-making, and contains twelve hoods, under which the bottoms are dried with gas, and a mixing-floor. The bottoms are what is known as the "dish" form, and contain eighteen tuyeres 21 inches long, each tuyere containing twelve $\frac{7}{16}$-inch holes. They are entirely rammed up with "ball stuff" of the following composition: Four barrows ground ganister, two barrows fireclay, one barrow fire-sand; four barrows of this mixture with one barrow of crushed fire-brick, and are very slowly and thoroughly dried for at least forty-eight hours. It is to this careful drying that I think our good results should be largely attributed. The bottom average for the year 1884 was 21·13 heats per bottom; 1885, 22·34 heats per bottom; and in 1886, 20·58 heats per bottom. The best month's average was

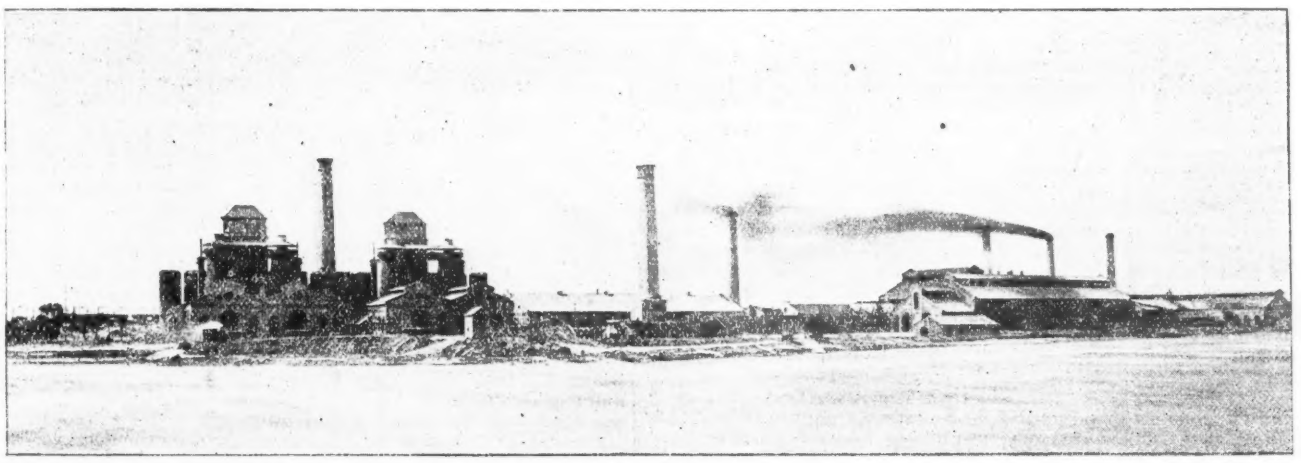
25·08 heats; the best week' saverage was 27 heats; the best single bottom ran 38 heats. The south end of the building is devoted to the repair of iron and steel ladles. It contains hoods for gas-drying. The ladles are lined with loam. North of the repair-shop is a producer-house, containing three blocks of Siemens producers of four fires each, for making gas for drying. The cost of coal for this purpose is about 10 cents per ton of ingots made. The blowing-engines and pumps for this department are situated in a separate building. The blowing-engines, of which there are two, are of the high-pressure condensing type, having steam-cylinder 54 inches diameter, air-cylinder 66 inches diameter and 60-inch stroke. These engines are capable of maintaining a pressure of blast of 25 pounds per square inch. The hydraulic pressure is supplied by two Worthington high-pressure pumps. This room contains also the necessary boiler-feed and tank pumps and a feed-water heater. The steam for these engines is supplied by a battery of fourteen boilers of 5 feet diameter of shell and 16 feet long, each containing thirty-four 4½-inch tubes. The fuel consumption for steam averages about 250 pounds. of coal per ton of ingots made. The steel is cast in molds of 14½ inches greatest diameter. The molds are made in our own foundry from metal taken direct from the blast-furnace. Their average life is about 75 heats each. The molds, as soon as stripped, are taken on cars out of doors and allowed to stand until perfectly cold before further use—a procedure which adds considerably to their durability, and keeps the converting house cleaner and cooler. The best month's product of this department is 21,438 gross tons of ingots: the best six months' product is 105,500 tons; the best week's product, 5078 tons; the best day's product, 993 tons.

RAIL-MILL DEPARTMENT.

The rail mill is a T-shaped building, having a total length of 490 feet. The main building is 80 feet wide; the small wing measures 160 × 80 feet; the large wing 328 × 80 feet. The small wing contains the heating-furnaces, the main building contains the rolling machinery, and the large wing contains the cooling-beds and finishing machinery. The furnaces are four in number, of the ordinary Siemens type, the bed measuring 24 × 6 feet. They each have six doors, and will hold twelve ingots. The gas for these furnaces is supplied by eight blocks of producers of four fires each, situated in a separate building at some distance from the mill. Not more than twenty-two of the thirty-two fires are ordinarily used, and the consumption of fuel averages about 175 pounds of coal per ton of finished rails. The ingots are charged and drawn by hydraulic apparatus, operated by a boy. The ingot is transferred from the furnace to the blooming-train by a hand bogie. The blooming-train is a three-high 40-inch train, driven by an engine of 48-inch bore and 54-inch stroke, with a fly-wheel weighing 53 tons. This engine is high-pressure condensing. The rolls have fifteen passes, eleven of them square passes and four of them roughing passes. The lifting-tables are of the ordinary "Fritz" type, operated by hydraulic power, and the rollers are driven by a small double-reversing engine. The train is driven at a speed of sixty-five revolutions per minute, and blooms regularly a four-rail ingot in 1¼ minutes. The men about the train are: A roller, a lever-man, a spell lever-man, a front and back tongs man, a spool-engineer, and a greaser. On leaving the blooming-train, the piece is carried on driven spools down a runway 120 feet long to the finishing-train, which is a two-high reversing-train of 26-inch diameter, containing seven passes, two being roughing and five finishing. This train is driven by a double-compound reversing-engine of following dimensions: High pressure cylinder, 42 inches; low-pressure cylinder, 72 inches: stroke, 42 inches; shaft, 16-inch diameter with 18 inches in main bearing; crank-pins, 15-inch diameter. The engine is coupled directly to the train, and rolls the piece in 1¼ minutes, reversing seven times, and attaining a speed of 135 revolutions per minute on the long passes. The piece is turned and shifted from pass to pass by a system of beveled collars on the spools which can only be seen to be appreciated. At a distance of 60 feet from the train on the back side is a shear for cutting off the ragged end of the bloom. The piece is run down to this shear after the first pass and is cropped, and then returned to the rolls. The men required about this train are: A roller, a front and back catcher, a front and back spool-engineer, a spell-hand, a shear-man, and a greaser. This train has rolled over 1800 rails, 30 feet long, in twelve hours. The average life of a pair of rolls is about 10,000 tons rails. Distant from the finishing-train 135 feet is a single saw driven by an upright engine. The saw and arbor is set on a sliding bed-plate moved in and out by means of hydraulic power, the cutting being effected by holding the rail stationary and pushing the saw through it. The saw is driven at a speed of 900 revolutions per minute. Near the saw, on line with the rail, is a steam-stamp for stamping the number of the blow on each rail. The boy that operates this also operates a system of gauges regulating the length to which the hot rails are cut. One man and a boy handle the rail from the finishing-rolls to the cooling-beds. The number of men and boys engaged upon the rail from the time it is delivered to the blooming-train until it is delivered upon the cooling-bed is seventeen, and the cost for this labor is about 8 cents per ton of finished rails. From the saw the rail is passed through a "Clark" cambering-machine, which delivers it upon the cooling-beds. A pulling-up arrangement consists of a bar of iron of nearly the length of the rail, to each end of which is attached an endless wire rope, which passes over pulleys situated at each end of the cooling-bed. These pulleys are driven by a system of shafts and gears, and by this means the hot rails are distributed to the four straightening-presses. The lever which throws the pulling-up arrangement into gear, as well as the lever which sets the drive-rolls to the cooling-bed in motion, are operated by one man. The straightening-presses are the ordinary gag-presses, but the rail is put in such condition by the cambering machine that each press easily straightens 450 rails in twelve hours. The chipping and filing and drilling of the rails are accomplished in the ordinary way. The capacity of this mill has never been fully determined. The best twelve hours' work is 1803 rails, 60 pounds per yard, making 479 gross tons. The best twenty-four hours' work is 3246 rails, 60 pounds per yard, making 859 tons. During this day two hours' time was lost in various ways. The best week's work of eleven shifts was 4200 tons, the best month's work was 18,250 tons, the best six months' work was 89,930 tons.

The total cost of the South Chicago Works was $2,750,000 or £550,000 sterling. The number of men employed averages about 2000. The amount of raw material annually consumed is as follows: Iron ore, 400,000 tons; coke, 250,000 tons; coal, 150,000 tons; and limestone, 80,000 tons.

In the discussion which followed the reading of the paper, and which we regret we are obliged to condense, Sir Isaac Lowthian Bell said that the accounts they got from America from time to time of course were of a very startling character. Generally speaking, in this country, they thought they had very good work when they made 1000 tons a week. They had also seen in some publications a comparison



THE SOUTH CHICAGO WORKS (NORTH CHICAGO ROLLING-MILL CO.).

of the inferior kind of work which was done in Cleveland, both as regards quantity and the consumption of coke as compared with what they had been doing in America. Now, in all these comparisons they had to consider the richness of the ore, its facility of reduction, and the amount of material which had to pass through the furnace.

For facility of calculation he had taken two years, and if Mr. Potter was making 50,000 tons a year, that meant that the furnace in one blast would have made 100,000 tons of pig. Well, Mr. Potter had taken the time required for relining a furnace at three months; he thought, speaking from his own experience, and in general from the experience of his neighbors, if they were to take that three months at about double that time. Perhaps he rather overstated that, but still it was not only the time occupied in relining the furnace, but the furnace, as they all knew, for some months did not do its full amount of work here.

At all events it would show the character of the calculation which he had applied to this American practice. He had deducted, therefore, one fifth of the furnace making from 5000 tons; that was, if they were blowing for twenty-four months, and then the furnace was out for six months, it meant that they must deduct 20 per cent. of the make. That really, therefore, left in two years and a half that the furnace would have made 80,000 tons. If he was rather erring on one side, he thought Mr. Potter was erring on the other side, with regard to the make that the furnaces were capable of producing in this country, so far as the length of time was concerned. In Cleveland it was not an uncommon thing to have furnaces lasting twelve, thirteen and fourteen years, in fact, they blew out at the Clarence Works only very recently a furnace which had been in blast thirteen years, and it was blown out in consequence of the condition of trade, and for no other reason; for, at the time of blowing out, it was making iron with as little coke as it had done at any time during its existence. If he took it not at Mr. Potter's figure, but only taking it at 36,000 tons, or 25,000 tons a year, assuming the cost of relining a furnace was £1,500, he made it that Mr. Potter's cost of relining per ton of iron made would be five or six times that which the English cost was.

They knew in Cleveland that in using the ordinary pipes for heating he blast, as soon as they exceeded something like 520 or 530 tons a week, t that moment the quality of the iron began to fall. He believed one dvantage, the chief advantage that ensued from using air of a highe

temperature, say up to 1300 or 1400 degrees Fahrenheit, was that they could drive a furnace more quickly than they could do with air at something like 1000 degrees. Well, of course, there was a great difference in the quantity of material they were passing through the furnace. At Chicago, for every ton of iron, he calculated that they passed through the furnace 31·7 of air and 6·3 of lime, making together 38, but in Cleveland they had to pass 47·6 of calcined ironstone and 10·4, making 58 of material for every ton of iron. Of course it was idle to compare a furnace making iron with 38 of ore and lime against one making iron with 58 of ironstone and lime.

A good deal had been said upon the saving of wages. He had no doubt that he was able to reduce very considerably the cost per ton for labor by driving his furnace at a higher speed, but the fact was that if they took a furnace in Cleveland making something like 500 to 520 tons of iron a week, he found that the moment they exceeded that quantity, the men either required higher wages or they required more men. He had no hesitation in saying that nine tenths of the men working at a Cleveland blast-furnace making that quantity of iron were taxed to the utmost limits of human endurance.

He was quite certain that in Cleveland they were making more iron per man per week by a considerable amount than Mr. Potter was doing.

Mr. Windsor Richards said some three or four years ago he visited the Chicago works. They were not doing very good work at that time, but they were now doing very excellent work indeed. He thought that the institution was highly indebted to Mr. Potter for this extremely valuable paper in laying his experience before them in so frank and free and open a manner. The statements Mr. Potter made were somewhat startling to our ideas, but we must accept them as being correct, because we know Mr. Potter to be a most able manager of works, and he thoroughly understands his business. All blast-furnace managers would agree that the faster they drove a furnace the more coke it consumed per ton of iron—that was his experience. When they made 700 or 800 tons a week they were using quite a hundredweight less coke than they were now in doing 1000. The only thing was that in making 1000 the furnace drove more regularly than when they were making a smaller quantity. But in America the more they drove the less quantity of coke they consumed per ton of pig-iron. He had a furnace at Eston making regularly 1000 tons a week, with about 12,500 to 13,000 cubic feet of air, and he could speak from very long experience of those furnaces that did better work driving at 1000 tons a week per furnace than when they were making 600 or 700. So that he was perfectly confident that those figures given by Mr Potter were entirely correct.

He (Mr. Richards) inquired very carefully into that at the Edgar Thomson Works when he was there; and although they could not give any explanation of it, they said that the fact was so, and that directly they could put above a thousand or twelve hundred tons a week they began to use less coke per ton of pig-iron. That was a most extraordinary thing. He did not think that Mr. Potter traced his improvement in working to the angle of the bosh, but that to him (Mr. Richards) was rather an important consideration, for during the last four or five years he had had much experience in the lining of blast-furnaces, and he had lined some sixteen furnaces during that period, and he preferred 68° as the best angle that he had found, and it was equally applicable to Cleveland iron as to hematite iron. Mr. Potter told them, and he had immense experience with those water blocks, that they were very successful, and had enabled him to preserve those lines, and that his furnaces had worked most regularly. He thought it was a very excellent point, a very valuable suggestion, and one that he should take the first opportunity of adopting. It took them a very short time to reline a blast-furnace. Two months were certainly not required if they were making large profits—if they were making £3 8s. per ton on steel rails, and it was necessary to have a blast-furnace put in very quick, he would undertake, and had done it, to reline a Cleveland furnace in four weeks.

Mr. Edmund Tosh said in the autumn of last year he visited the United States, and had actually seen those furnaces. Before discussing the economical side of the question, he should like to bear his testimony to the remarkable courtesy, openness and frankness with which the smelters of the United States met anybody from this side of the water, and no smelter from this country could go over there without coming back in many respects wiser. The first furnace to which he gave attention was one incidentally mentioned in this paper—namely, the Isabella Furnace, at Pittsburg. At Isabella, the record of the South Chicago has been quite distanced, almost the average practice per week exceeding 1800 tons, with a coke consumption of something like 2150 pounds per 2240 pounds of pig-iron. That, he thought the Institute must admit, was admirable work, and it had on several occasions been beaten, the output being over 2000 tons a week on several occasions. That was not an isolated case, such as we all know of in our experience at home, where we turned out a large rate per furnace, and some paragraph writer got hold of it; but he had had access to the books of the Isabella furnace, and the regular weekly product did not exceed 1800 tons, but it came very near it. In going to Chicago, Mr. Potter showed him every thing, and made out that in his practice he did not force the furnace quite to the same extent that the furnace was driven at Isabella; the blast pressure at Chicago being at 7 pounds on the inch, as against 9 or 10 at Pittsburg; but so far at he could make out from Mr. Potter himself, at Isabella and Pittsburg the life of a furnace—the output of a single lining—was something like 150,000 tons. In his own experience at Ulverston, the furnace would run from four to five years, and the average output was from 650 to 700, and up to 800 occasionally, per week of Bessemer iron No. 1, 2, and 3.

Comparing life for life of the American furnace as against the hematite furnace, he found that they were practically the same, about 150,000 tons of pigs. On the question of economy, as Sir Isaac Lowthian Bell had pointed out—and Mr. Richards followed pretty much on the same tack—the number of tons turned out by a plant depended initially upon the number of tons of coke consumed, or the number of cubic feet of air which was forced into the furnace. They might make 2000 tons a week by means of four furnaces, or they might make them by two. But in any case, assuming that they were working with equal economy, they were using the same number of tons of coke, and they were pumping the same weight of air into the blast-furnace. In like manner that meant that the blowing appliances should be the same for both equipments. In the same way the blast must be heated, therefore their stove-heating power must be exactly the same; also as to boilers, the force required to drive the engines must be the same, or practically the same, and the sole difference between the two plants of four furnaces and two furnaces, both giving the same output, rested upon the stack, and the stack by itself was by no means the most costly part of a blast-furnace plant, and without giving a very dogmatic opinion upon the subject, and without being able to go into the details of the argument, he was strongly disposed to think that the English practice running from 700 to 750 tons per week, was in the long run as economical as the larger output of our American cousins. He had a long correspondence since his return with Mr. Walker Kennedy, the very able manager of the Isabella furnace at Pittsburg. Mr. Kennedy had stuck to his guns, and he (Mr. Tosh) held that the Americans were not on the right track, and he did not think there was a great deal between them in the long run.

The discussion was closed by Sir Isaac Lowthian Bell as follows: "I would bear testimony to the truth of what has fallen from my friend, Mr. Richards and Mr. Tosh, as to the entire truthfulness of every statement that Mr. Potter may make, and I believe that no English ironmaster knows him better than I do, and it is impossible that any one could have received greater attention than I have done at his hands. Of course, it must not be understood for one moment that I am throwing the slightest doubt upon any thing that Mr. Potter has said. All that I differ from him is upon the question of economy by driving furnaces as quickly as he does, but still I am bound to say, when he makes a statement in the manner he has done to me, and in the manner in which he does in this paper, it requires one to examine his statements with very great care, and consider whether he might not be right and I may be wrong."

We have been favored by Mr. Potter with a copy of his reply to the above discussion. This will hereafter appear on the Transactions of the Iron and Steel Institute,—EDITOR ENGINEERING AND MINING JOURNAL.

REPLY TO DISCUSSION ON PAPER READ BEFORE THE IRON AND STEEL INSTITUTE.

I can not but feel most highly complimented and most deeply gratified at the courteous reception accorded my effort and the full and critical discussion of its salient points. Fully appreciating the reputation my countrymen enjoy of a tendency to brag, it was with no little hesitancy that I presented for your consideration an array of facts that no doubt seemed startling. It was most reassuring to me, therefore, to have my statements vouched for by gentlemen so eminent in their profession, and whose word carries so great weight of testimony.

In drawing a comparison between English and American furnaces, I would not be interpreted as saying that furnaces working Cleveland ironstone ought to be making the same output as our furnaces make with the rich and fusible hematites of Lake Superior, as such a position would be preposterous and untenable. The mooted point seems to be American fastdriving *vs.* English slow driving, and I gather from the remarks of the gentleman that, were they once convinced that the former was the more economical, it would be but a matter of a little time and more engines before the Americans would be quite outdone in blowing. It seems to me the only true measure of the life of a furnace is the amount of product that can be taken off a lining. If one lining will take 150,000 tons of iron, the American furnace will have it made in two years and a half, while the English furnace making five hundred tons per week will require six years to do it. But as Sir Lowthian Bell has said he has run a furnace fourteen years on a single lining, that lining would therefore have made in the neighborhood of 350,000 tons. The American furnace, by rapid driving, wears out its lining so much faster, that it makes less than half as much product during its life. But to what expense is the American furnace put in order to make 350 000 tons? Merely the cost of another lining, and even then it accomplishes the 350,000 tons in less than half the time that the English furnace requires. Is it any advantage, then, to be able to put out more than double the quantity of iron in a given time, with no further expense than the cost of a furnace lining? We Americans think it is a great advantage. I desire to correct Sir Lowthian Bell with regard to the time required for a furnace to get up to full product after blowing-in, as his estimate is much to large when applied to American furnaces. Our furnaces are dried for four days before blowing-in, by injecting superheated air, beginning at about 800 degrees Fahr. and increasing gradually till at the end of the operation the temperature is 1400 degrees Fahr. This puts the furnace in the best possible condition, much better than could be effected by the old method of building a coal fire in the fore-part. After blowing in, we usually get the first cinder in sixteen hours and the first iron in twenty or twenty-two hours after blast went on. The first week we make 900 tons, the second week 1200 tons, and the third week the furnace is on full product. The first cast of iron after blowing-in is taken directly to the steel-works. It is as good as any iron subsequently made. The amount to be deducted from the make of iron for the blast on this account practically amounts to nothing. The 150,000 tons output for the blast includes the time required for bringing the furnace up to full product.

I would like to call Mr. Windsor Richards' attention to the fact that the development of our present furnace practice was due, not to heavy demand and large profits, but quite the reverse, it being, in fact, more in the nature of a struggle for existence. In the year 1885, when steel rails were selling for $25 per gross ton, which was practically a free trade basis, the duty of $17 per ton availing us nothing, the strictest economy in every branch of manufacture had to be studied and practiced.

As our largest item of expense is for fuel, and our greatest waste was in its use in the blast-furnace, it was here that the largest opportunity was afforded and here the greatest saving was accomplished. It was not, therefore, when orders were plenty and profits were large that the improvement in furnace practice was made, but it was brought about by a stern necessity and an endeavor to make both ends meet. It is more probable that if trade were always in that happy condition of yielding

the profit of £3 8s., as mentioned by Mr. Richards, that, following the happy-go-lucky character of Americans, who are usually quite willing to let well enough alone when "well enough" means 50 per cent., there would have been no furnace records at South Chicago that I would have cared to present to the Institute.

Be this as it may, we have reached, as far as we can discover by the light of our present knowledge the limit of economical output for this size of furnace. We can not exceed 1500 tons per week or fall below 1300 tons per week without waste of fuel; and on the other hand we have not yet succeeded in attaining for any length of time a much better fuel consumption than 1800 pounds coke per gross ton of iron. A larger output than 1500 tons per week can only be accomplished by hard blowing, and consequent great and wasteful consumption of fuel, or by charging in pure metal at the tunnel-head, and thereby operating the blast-furnace as a cupola, a method not wholly unknown to some American managers.

As regards the form of the furnace, it has been slowly developed, and while I would not say that it has attained perfection in its present form, and affords absolutely no room for further improvement, yet its operation has been so entirely satisfactory that it will be long ere we shall see the need of further modification. In this matter, however, as in most others, there is no disputing of tastes.

For years the English furnaces have led the world in economical iron production. For years the American iron masters have put forth their best endeavors to emulate the magnificent records of their British confrères. In acknowledging the great value of their teachings and the knowledge and benefit we have gained from a study of their work and their experience, may we not be pardoned a little self-congratulation on our attainment of something nearer the perfection of our preceptors?

Bleaching Compounds of Alumina.—A process has recently been devised and patented by R. Weiss, of Charlottenberg, Berlin, for the preparation of these compounds by the direct action of chlorine on aluminate of potassium, sodium, calcium, barium, magnesium, or zinc, either in the solid form, or dissolved, or suspended in water. The chlorine is allowed to act on the dissolved, or suspended, or solid aluminates, as long as an energetic absorption is perceptible, all the usual precautions being observed, as in the manufacture of liquid and solid bleaching lime.

The German Potash Combination.—The increased percentage (from 4 per cent to 4·8 per cent) of the Vienenburg potassium salts works in the output of carnellite will commence on the first of July next. The seven potassium salts works at present in activity, all of which belong to the syndicate, will be engaged in the daily production of carnellite, which will amount to 56,090 ctrs, in the following proportions: Anhalt will produce 15,408 ctrs, Prussia 11,000, Aschersleben 8789, Neustassfurt 8714, Ludwig II. 4235, and Nuenburg 2640.

Experimenting with Heavy Rails.—The Pennsylvania Steel Company, the Cambria Iron Company and the Edgar Thomson Steel Works have been making seventy-five-pound steel rails for the Pennsylvania Railroad Company for a year or two. This company now proposes to put down on a part of its New Jersey line, as an experiment, a few ninety-pound rails, to be imported from England, where rails of this weight have long been in use. If the experiment should prove to be satisfactory, our own works will, of course, supply all the ninety-pound rails that the company may need. This is a move in the right direction, and it was to be expected that the Pennsylvania Railroad, the best managed road in the world, would be the first in this country to adopt the heavy section. They had better, however, go at once to the 100-pound section which is now used in Belgium.

Remarkable Results in Steel Castings.—The report of Robert H. Galt, U. S. N., showing the tensile tests of the steel casting for the rudder frame for gunboat number two, being built at Baltimore, has just been received from the Midvale Works, Pa. This material, while showing a very high ultimate strength, 72,198 pounds, gave the most remarkable elongation of 32·50 per cent., with a reduction of area of 37·91 per cent.

Lieutenant Milligan, who has been keeping the record of tests from the beginning, says that these are the most remarkable results yet attained. The cold-bending specimens were bent through an angle of 116° without showing a trace of fracture. Lieutenant Milligan further says that a comparison he has made of the results in foreign establishments shows that our steel makers are now far ahead of any thing ever turned out abroad.

The British Sulphate of Ammonia Trade.—A correspondent of the *Progressive Age* says statistics recently published show that there are 364 works at which sulphate or muriate of ammonia is made, or gas liquor is otherwise treated, now established in England. This number includes gas works at which sulphate of ammonia is manufactured, as well as chemical works properly so-called. The total product of these works for 1886 was 106,610 tons; gas works produced 82,480 tons; iron works, at which bye-products are recovered from the gases of the blast-furnaces, produced 3950 tons; shaly works produced 18,080 tons, and coke and carbonizing works 2100 tons. Of this quantity only 22,000 tons, or one fifth of the whole product, was consumed for home purposes, the remainder being exported. Germany is the largest consumer of this product. The fact that so small a quantity of sulphate of ammonia is consumed in England goes to show that English farmers are much in want of education upon the merits of this salt as a manure. The sulphate is produced in their own neighborhood, for gas works are scattered throughout the country, and it must be cheaper to the English farmer than it can be to the foreign consumer, who has to pay heavy charges for carriage before it can reach his farm. If it pays the German or Belgian farmer to purchase sulphate and pay the inevitable cost of carriage, it would surely pay our farmers to buy it as produced within easy distance of their farms.

Coal Production in France.—Some valuable statistical information has just been made available with reference to the production and consumption of coal in France. It appears that the extraction of coal and lignites from the French soil last year was as follows: Coal, 19,558,928 tons; lignites, 455,669 tons; total, 20,014,597 tons. In 1885, the corresponding figures stood thus: Coal, 19,068,548 tons; lignites, 441,982 tons; total, 19,510,530 tons, showing a general increase for last year of 504,067 tons. French coal is beginning to drive foreign coal out of French markets to some extent, the total imports of foreign coal last year into France having been 9,425,487 tons, as compared with 9,943,469 tons in 1885, showing a reduction in imports last year of 517,982 tons. The close approximation of the decline in the imports to the increase in the output last year was certainly not a little remarkable. Of the coal imported into France last year, 3,470,612 tons came from England, 3,917,036 tons from Belgium, 973,314 tons from Germany, and 5243 tons from other countries. The imports of English coal into France last year fell off 184,708 tons, as compared with 1885, while the imports of Belgian coal declined to the extent of 124,410 tons; those of German coal to the extent of 135,981 tons; and those from other countries to the extent of 185 tons. Belgian coke was imported into France last year to the extent of 783,187 tons, German coke to the extent of 263,026 tons, and other coke to the extent of 13,069 tons. These figures when compared with those for 1885, show reductions of 67,628 tons, 4917 tons, and 153 tons respectively. The falling off in the imports of foreign coal into France last year was most marked in the case of German coal, which showed a decline of rather more than 10 per cent. The corresponding decline in the case of Belgian coal was about 4 per cent; and in the case of English coal, 5 per cent.

BOOKS RECEIVED.

[In sending books for notice, will publishers, for their own sake and for that of book-buyers, give the retail price? These notices do not supersede review in another part of the Journal.]

Die Aufbereitung der Erze. (Ore-dressing.) By C. Linkenbach, engineer of the Lead and Silver Works at Ems, Germany. Published by Julius Springer, Berlin, 1887. Pages 152 and index. Illustrated. Price $10. This work will receive more elaborate review in these pages at an early day.

PATENTS GRANTED BY THE UNITED STATES PATENT-OFFICE.

The following is a list of the patents relating to mining, metallurgy, and kindred subjects, issued by the United States Patent-Office.

PATENTS GRANTED JULY 12TH, 1887.

366,202. Apparatus for Measuring Electricity. Jules Cauderay, Paris, France.
366,226. Traction-Engine. Frank F. Landis, Waynesborough, Pa.
366,228. Direct-Acting Steam-Engine. Mirabeau N. Lynn and Elmore P. Lynn, Rising Sun, Ind., Assignors by mesne assignments to the Lynn Engine Company, Dayton, O.
366,234. Tubular Boiler. Harley N. Merwin, Irving A. Merwin, and Oliver Merwin, Iroquois, Dak.
366,236. Rolling-Mill Appliance. Charles H. Morgan, Worcester, Mass.
366,245. Machine for Barbing and Winding Wire. Ferdinand Philips, Philadelphia, Pa.
366,247. Machide for Feeding and Punching Scrap Sheet Metal. Clark M. Platt, Waterbury, Conn., Assignor to the Platt Bros. & Company, same place.
366,254. Device for Casting Metal. Robert A. Regester, Baltimore, Md.
366,255. Method of and Means for Burning Coal, etc., in Stoves and Furnaces. Joseph T. Robbins, Newton, Iowa.
366,267. Automatic Regulator for Electric Motors. William Stanley, Jr., Great Barrington, Mass., Assignor to George Westinghouse, Jr., Pittsburg, Pa.
366,268. Electric Meter. William Stanley, Jr., Great Barrington, Mass., Assignor to George Westinghouse, Jr., Pittsburg, Pa.
366,273. Welding Compound. Hugh B. Stenson, Hancock, Minn.
366,281. Explosive Compound. Carl W. Volney, Toms River, N. J.
366,282. Blast-Furnace. Edward Walsh, Jr., St. Louis, Mo.
366,286. Ornamentation of Sheet Metal. James Wood, Pittsburg, Pa.
366,320. Miner's Candlestick. David B. James, San Francisco, Cal., Assignor to Frank A. Huntington, same place.
366,346. Igniting Apparatus for Gas and Petroleum Engines. Mathias V. Schiltz and Edward Quack, Cologne, Germany, said Quack Assignor to said Schiltz.
366,347. Electrical Converter. Albert Schmid, Allegheny, Assignor to George Westinghouse, Jr., Pittsburg, Pa.
366,349. Regulator for Self-Exciting Alternate-Current Electric Generators. Oliver B. Shallenberger, Rochester, Assignor to George Westinghouse, Jr., Pittsburg, Pa.
366,350. Safety-Strip for Electric Circuits. Oliver B. Shallenberger, Rochester, Assignor to George Westinghouse, Jr., Pittsburg, Pa.
366,351. Combined Supply and Regulating Valve for Gas. Homer Stewart, Beaver Falls, Pa., Assignor of three fourths to Mary Elizabeth Frederick, East Liverpool, and Samuel M. Lawrence, Salem, Ohio.
366,354. Non-Conducting Cover for Pipes. Frank M. Thomson, New York, N. Y., Assignor to Shields S. Brown, Chicago, Ill.
366,366. Drilling-Machine. John Bailey, Carpentersville, Ill., Assignor to the Illinois Iron and Bolt Company, same place.
366,367. Hydraulic Press. John Bailey, Carpentersville, Ill., Assignor to the Illinois Iron and Bolt Company, same place.
366,375. Electric Converter. Henry M. Byllesby, Pittsburg, Pa., Assignor to George Westinghouse, Jr., same place.
366,376. System or Circuit for Electrical Distribution. Henry M. Byllesby, Pittsburg, and Oliver B. Shallenberger, Rochester, Assignors to George Westinghouse, Jr., Pittsburg, Pa.
366,383. Apparatus for Automatically Coiling Wire Rods. Fred. H. Daniels, Worcester, Mass.
366,384. Mechanism for Transfering Coils of Wire. Fred H. Daniels, Worcester, Mass.
366,390. Rods for Rolling Wheel-Tire Bars. William Fox, Leeds, County of York, England.
366,392. Compound Engine. Harvey F. Gaskill, Lockport, N. Y.
366,395. Mechanism for Reducing Old Rails to Rails of Smaller Size. William H. Howells, Bridgeport, O.
366,402. Brick-Kiln Mills. Kehoe and Anthony Zilker, New Albany, Ind.
366,422. Machine for Making Wire Rope. Robert S. Newall, Gateshead, County of Durham, England.
366,440. Steam-Engine. Jesse Walrath, Racine, Wis.
366,450. Furnace-Grate. Edward Boutcher, London, England.
366,468. Dredging Apparatus. Joseph Edwards and James R. F. Kelly, Brooklyn, N. Y.
366,480. Automatic Cut-Off Valve Gear. John W. Hayes, Portsmouth, N. H.
366,486. Machine for Bending Sheet Metal. Philip Kimmel, Altoona, Pa.
366,487. Process of and Apparatus for Distilling Petroleum. J. Moritz Krieser, Brooklyn, Assignor, by direct and mesne assignments, to the Mystic Oil Company, New York, N. Y.
366,539. Safety Appliance for Gas Distribution. Arthur Wales, Allegheny City, Assignor to George Westinghouse, Jr., Pittsburg, Pa.
366,544. Electrical Converter. George Westinghouse Jr., Pittsburg, Pa.
366,545. Railway Rail. William Wharton, Jr., and Edward Samuel, Philadelphia, Pa., Assignors to William Wharton, Jr., and Company (Incorporated), same place.
366,581. Automatic Feed for Rock-Drills. Sullivan D. Harris, Atlanta, Ga., Assignor of one half to Asa Lyman Harris, same place.
366,609. Composition of Brick. William Rennyson, Norristown, Assignor of one-half to Hugh Burgess, Ardmore, Pa.
366,622. Gas-Regulator. Benjamin F. Fertick, Columbus, O.
366,631. Ore-concentrator. Hieber F. Learnard, Fort Collins, Colo., Assignor of one third to Perry B. Learnard, same place.

REISSUES.

10,850. Method of Casting Car Wheels. William Wilmington, Toledo, Ohio.

PERSONALS.

According to London papers, Mr. Whitney, of Santa Rita copper fame, has arrived in England with a big scheme for the safe guarding of British capital.

Major Henry W. Dunning, who was largely interested in the mining industry in the West, died at Wichita, Kansas, last week.

Colonel C. C. Morgan has been appointed Superintendent of the Durrant and One Thousand and One mines, at Aspen, Colo., to succeed R. Y. Anderson.

Mr. William F. Durfee has been appointed General Manager of the Pennsylvania Diamond Drill Company, whose works are at Birdsboro, Pa.

The Mining Institute of Western Pennsylvania has been organized at Monongahela City. T. S. Hutchinson was elected President, Wm. Seddon, Secretary.

Messrs Scott & Anderson, long the agents of the Mingo Smelting Company, at Salt Lake City, Utah, have retired, and been succeeded by Mr. J. N. Teleman.

Dr. I. Magin and Mr. Tom Davis will start for South America on the 20th inst., and on their arrival at the mines of the El Chontadura Mining Company at Cali will start up active operations.

Our excellent contemporary, *Light, Heat and Power*, issued at Philadelphia, has become a semi-monthly journal, and will be published on the first and fifteenth of each month.

J. L. Pennock, of the firm of C. E. Pennock & Co., iron manufacturers, died at his residence near Coatesville, Pa., on the 11th inst., aged 60 years. He has for years been one of the most successful iron manufacturers in the State of Pennsylvania.

Mr. E. W. Gaylord, manager of the Clyde Coal Company's mines at Angus, Iowa, while standing in the shaft of the new Standard mine, was struck by a descending elevator last week and instantly killed. He was deaf and did not hear the descending elevator. Mr. Gaylord was formerly general superintendent of the Minneapolis & St. Louis road.

Freiherr von Faber, the founder of the lead pencil firm of A. W. Faber, at Stein in Germany, recently celebrated his seventieth birthday. He has changed the village of Stein (near Nüremberg) into one of the finest in Germany, founded the famous Germanic Museum in Nüremberg, and will be remembered for many other charitable bequests.

The *Mining Industry* is the name of a new and very creditable paper, whose publication has been commenced in Denver, Colo. L. A. Kent and W. C. Wynkoop are the editors and publishers, and the first and second numbers of this paper are written with knowledge, discretion, and excellent tone. We welcome our contemporary as one that may do much to promote the interests of legitimate mining in the West.

FURNACE, MILL, AND FACTORY.

During the shut-down at the mills of the Beaver Falls Iron Company, Beaver Falls, Pa., extensive repairs will be made and new machinery added.

The Cheney-Bigelow Wire-Works, Springfield, Mass., has been incorporated, with a capital of $60,000. Josiah H. Bigelow is president, and Wellington D. Stevens treasurer.

Furnace A of the Edgar Thomson Steel Works, at Braddock, Pa., was blown last week. It will, at usual, make ferro-manganese. All of the seven furnaces of this plant are now in blast except E.

The city of Eau Claire, Wis., has made a proposition to Messrs. Lean & Blair, of Pittsburg, similar to the one made to Messrs. Van Sickler & Co., of Pittsburg, as mentioned in our issue of June 18th, for the erection of an open-hearth steel plant.

The Great Southern Iron, Brass and Engine Company which has a capital of $300,000, will locate in West Nashville, Tenn., to do general machine work. H. R. Walker will be general manager. The Fuel Economizer Company will also build its machines in the same works.

The removal of the rolling-mill at Pomeroy, O., to Bowling Green, O., has commenced. The citizens of Bowling Green donate the land for the plant, agree to furnish free all the natural gas for fuel, and have offered other inducements that decided the owners to go there. The contract requires the parties to be making iron by January 1st, 1888.

The Alabama Automatic Water-Gas Company has been organized at Birmingham, with a capital stock of $250,000; shares, $100 each, divided into 2500 shares. The company proposes to manufacture gas under the "Sloper" process. The officers are: Fred Sloss, President; J. E. DuBois, Vice-President; H. M. McNutt, Secretary and Treasurer; W. H. Rose, General Manager.

W. H. Everson & Co., of the Scotdale Iron-Works, Pittsburg, Pa., made an assignment on the 13th inst., to W. Minor Smith, President of the Windsor Locks Steel Company, of Bridgeport, Conn. The statement presented to the creditors shows $516,700 in available assets, and $265,462.25 total indebtedness. A. H. Childs, James Laughlin, Jr., and F. M. Hoffstot were appointed a committee to look into the matter of a settlement.

The company about to erect refining-works at Pittsburg, Pa., includes W. H. Elkins and P. H. Widener, of Philadelphia, and David P. Reighard, of Pittsburg. The oil will be run from the oil region through the company's own pipes. It is only about six months since Mr. Reighard sold the Empire Works to the Standard. The new works will have a capacity of 12,000 barrels a week, and will also engage in the manufacture of electric light carbons, having obtained a one half interest in the Empire Carbon Company, which is the only carbon works not in the recently organized carbon works pool.

The Crucible Steel-Works, Cleveland, Ohio, which had been shut down for some time, have started up again. This company makes what appears to be an excellent quality of steel, obtained from old steel of any kind, either in the form of rail ends, sheets or bars. The Cleveland *Iron Trade Review* states that the work is done in a heating furnace constructed differently from the ordinary kind only in the matter of bottom. Instead of the customary sand base, the bottom is composed of a mixture of pulverized iron ore and ground-up fire-brick which is reduced to a semi-liquid state. After being allowed to cool the ore forms a homogeneous mass with the brick, and the furnace is then ready for work. When the bottom is quite hardened the furnace is charged sufficiently with tap cinder to make a slag bath to a depth of four or five inches. A charge of steel of about two tons is then charged into and submerged in the bath, and is heated to a degree of heat varying from 4500 to 5000 degrees. By means of the slag bath oxidation is prevented, and a quality of reheated steel is produced, said to be possessed of a greater tensile strength and to be more malleable than Bessemer. Its tensile strength is stated to be 85,000 pounds, and its ductility is claimed to be equal to that of the best Norway iron. We have seen some bars rolled from steel produced by the above-described process which seemed in every way to bear out the claims made for the process. It is proposed to utilize the product largely for wheel tires, horse-shoe bars and similar purposes.

CONTRACTING NOTES.

Contracts Open will be found on page xix. New contracts this week: No. 442, Bridging, Trestles, etc.; No. 443, Water-Works; No. 444, Iron-Work; No. 445, Wire Strand; No. 446, Bridge; No. 447, Sewer; No. 448, Bridge.

The Philadelphia Emery Wheel Co., No. 624 Cherry street, Philadelphia, desire to purchase native magnesite (magnesium carbonate).

The Sherman Electric Light and Power Company, Sherman, Texas, is considering the question of putting in in connection with its present plant a system of incandescent light.

The Lowe Manufacturing Company, Norristown, Pa., will pay $10,000 for any satisfactory invention of a meter that will correctly register atmospheric air, from a holder under a pressure varying from one eigth to one pound per square inch.

The Austin Water, Light and Power Company, Austin, Tex., has contracted for three Westinghouse machines of 1300 lamps each and four 80 horse-power boilers. The above is in addition to the present plant, consisting of 110 Brush 2000 candle-power lamps.

A company is wanted to build water-works for the town of Johnson City, Tenn. The estimated cost of works, all included, is $60,000. The water can be brought in by gravitation. Further particulars can be learnt from C. K. McCallum.

The Commissioners of the Water Department, Baltimore, Md., have ordered a contract with the Holly Manufacturing Company for furnishing pumping engines at a cost of $17,000; also, for furnishing boilers, 5 by 14 feet, at $2600.

The most important contract let in the Northwestern country for some time has just been taken by E. P. Allis & Co., Milwaukee, Wis., for the erection of a 1200-barrel mill at Rat Portage, Manitoba, for the Lake of the Woods Milling Company, at a cost of $200,000.

Messrs. Smith Brothers & Co., proprietors of the La Belle Steel-Works, Pittsburg, Pa., have contracted with the Twindell Construction Company for the erection of a 15-ton open-hearth steel melting furnace, which will, in all probability, be completed about August 15th next.

The contract for furnishing coal for public buildings in the city proper, Boston and Roxbury, Mass., has been awarded to L. G Burham & Co., at $5 35, $5.60 and $5.85; Boston and Dorchester, to H. G. Jordan & Co., $5.10, $5.35 and $5.60; in Brighton, to Gillespie & Pierce, $5.28; in Charlestown, to E. Keyes, $5.10, $5.35 and $5.60.

George C. Morgan, of Chicago, Ill., has secured the contract to construct his stand-pipe system of water-works in Jerseyville, Ill., for $29,000. This is to include four and one quarter miles of main pipes, two boilers and pumps, well, reservoir, tower 13 feet in diameter and 116 feet high, 8 feet of brick and 36 feet of iron.

The Twindell Construction Company, of Pittsburg, Pa., has closed a contract with the Pittsburg Rustless Iron-Works for the erection of a Bower-Barff Rustless iron plant. The contract calls for the erection of an oxidizing furnace, annealing furnaces, drags, and, in fact, every thing necessary to make the plant a complete one. It is expected to be in operation about August 10th.

The State Board of Supervision, Madison, Wis., has contracted for furnishing coal to the several institutions under its charge: At Janesville, 400 tons of small egg at $6.85, and 15 tons of chestnut at $7.15 per ton; at Mendota, 3000 tons of Indiana block at $3.84; at Madison, 300 tons of gas coal at $4.83; at Winnebago, 3,000 tons of Hocking Valley at $4.35; at Milwaukee, 300 tons gas coal at $4 50; at Waukesha, 700 tons Hocking Valley at $3.35, 80 tons of small egg at $5.68; at Delavan, 800 tons of Hocking Valley at $3.95; at Waupun, 1200 tons of Hocking Valley at $4.05; at Madison, 800 tons anthracite coal for $4.75.

LABOR AND WAGES.

So far there are no signs of an approaching termination of the strike at the Delamater Iron Works, New York, to which we have referred in previous issues.

The difficulties in the Connellsville coke region, Pa., continue. A number of non-union men are at work at the different works, which are still guarded by Pinkerton's men.

About 800 workmen at the Black Diamond Steel Works of Park Brothers & Co., Pittsburg, Pa., struck on the 4th inst., because the firm refused to reinstate a number of union men recently discharged.

The third annual convention of the Federated Association of Miners for Indiana will be held at Terre Haute on the 19th inst. The business of the convention will be the election of officers and other business. The Federation recently scored a victory in securing the five-cent advance of May 1, and the order is gaining favor with miners. The movement to federate with the Miners' Assembly of the Knights of Labor did not succeed, and it is hardly probable that the order will merge into any organization where its identity will be lost.

Five coal operators and five representatives of the miners of the Tuscarawas Valley, Ohio, at a conference held at Massillon last week, agreed upon the following schedule: Standard thickness of coal shall be four feet and over. When mining rates for standard coal are fixed at 75 to 95 cents per ton, all cost below standard thickness shall be paid for at the rate of 4 cents per ton additional for each three inches below said standard thickness. When mining rates are fixed at 75 cents per ton the price paid for driving single shaft entries shall be $2 per yard, and for every advance or decline of 10 cents per ton in mining rates an advance or decline of 25 cents per yard shall be made in entry prices; double shaft entries shall be paid 25 cents per yard addition. Net entry shall be paid such additional price per yard as may be agreed upon by the entry men and mine boss. "Break throughs" of all kinds $1.50 per yard based on 80 cents per ton mining; price yardage to advance and decline in proportion to mining rates.

GENERAL MINING NEWS.

Shipments of iron ore from the mines of the districts mentioned below for the season up to and including July 6th, as reported by the Marquette *Mining Journal*, were as follows:

	Tons. 1887.	Tons. 1886.
Marquette, Marquette District	257,937	308 054
St. Ignace, " "	33,216	18,956
Escanaba, " "	360,110	203,973
" Menominee District	368,995	314,956
Ashland, Gogebic District	301,003	184,961
Two Harbors Minnesota Iron Company, Vermillion District	94,299	86,073
Total tons	1,305,560	1,116,973

ALABAMA.

The Sheffield Land Company, the Alabama & Tennessee Coal and Iron Company, the Sheffield & Birmingham Railroad Company, and the Sheffield Furnace Company have agreed to consolidate. A meeting will be held at Sheffield, Ala., on the 29th instant, to conclude arrangements. The consolidated company will be capitalized at $10,000,000. Advices state that if they do unite they will compose the second largest coal, iron, and railroad company in the South. It will embrace the property of the Sheffield Land Company, including the furnace that company is now building, and all the property about Sheffield. It will also embrace the furnaces being built by Shook, Ensley, and others at Sheffield, including also the three furnaces at Sheffield being built by the Alabama & Tennessee Coal and Iron Company, and the 70,000 acres of land owned by that company in the Black Warrior coal-fields, and the railroad from Sheffield to Birmingham. This will make in all about 100,000 acres of land, both coal and iron.

COOSA COAL AND COKE COMPANY.—The plant of this company, at Rayland, has been sold under execution, and was purchased by the Cherokee Iron Company.

HOENE WARRIOR AND JEFFERSON COAL COMPANY.—This company has purchased about 2000 acres of mineral lands and mines known as the Drake mines, and is now reopening the same.

ARIZONA.

The Maricopa & Phœnix Railroad has been finished to Tempe, and opened for passenger and freight traffic between that point and Maricopa. There now remains but eight miles to complete the line to Phœnix, and the necessary material is already on the ground.

COCHISE COUNTY.

HEAD CENTER MINING COMPANY.—This company had cash on hand July 1st amounting to $706.14.

HEAD CENTER & TRANQUILLITY MINING COMPANY.—This company had cash on hand July 1st amounting to $8,475.43.

PIMA COUNTY—QUIJOTOA DISTRICT.

The companies mentioned had cash on hand July 1st as follows: Crocker, $10,552.17; Peer, $8,596.64; Peerless, $9,895.60.

PINAL COUNTY.

J. D. REYMERT MINING COMPANY.—Official advices report the production for June to have amounted to $2,494.32

BRAZIL.

The discovery of coal is reported from the following places in Brazil, : Serra de Ibituruna, in the province of Minas Geros; Cerquilho, in the province of Sao Paulo.

BRITISH COLUMBIA.

VICTORIA COAL COMPANY.—The coroner's jury investigating the explosion at this company's mine at Nanamo found that it was caused by the firing of a badly planted shot, and that the necessary precautions were not observed. We referred to the above in our issues of May 3d and 10th, and June 25th.

CALIFORNIA.

AMADOR COUNTY.

CHICAGO.—This mine was recently sold by the constable to satisfy a judgement purchased by B. Levaggi. The property was bought in by Levaggi for the amount of judgement and costs—about $400. All the other claims against the company have been satisfied. It seems that the attachment suit in this case was commenced against the company under a defective name, and the property sold under such conditions. There is a probability of further litigation.

HECTOR GOLD MINING COMPANY.—The Amador *Ledger* states that this company, which has recently been brought on the New York market, owns the old Mahoney mine, which has already surrendered a large amount of bullion, and no reason whatever exists to suppose that it has been exhausted of its treasures. It has a 40-stamp mill and good hoisting machinery, indeed all the requisites for the energetic prosecution of work. The object of the stock being placed in New York is to provide working capital for the actual development of the mine.

MOORE.—Work at this property has been suspended owing to differences between the stockholders.

PLYMOUTH CONSOLIDATED GOLD MINING COMPANY.—The semi-annual report just issued shows the company produced for the first six months of 1887 $387,075.21; the operating expenses for the same period amounted to $142,853.87, leaving a profit of $244,221.34. The addition to the Pacific mill, forty stamps, cost $44,324.20. The new stamps commenced work the first week in May, and have been running continuously since. Their operation is entirely satisfactory. Level No. 7 will be opened in August. The trustees believe that the policy inaugurated nearly two years since, of working up the low-grade ores first and using only so much of the better rock as is necessary to economical working, should be continued. This course will produce in the end the largest results to the stockholders. The mine is in excellent condition and the prospect better than at any previous time. We have extensive reserves of high grade ore, which will be increased by the opening of Level No. 7. The bodies of lower quality are of enormous magnitude. The company had cash on hand July 1st amounting to $130,977.03.

EL DORADO COUNTY.

MONTEZUMA GOLD MINING COMPANY.—Of this company, which has just been brought on the New York market, and for the stock on which subscriptions are now being received, the local papers state that the Montezuma mine is one of the first quartz locations in the State, and at one time employed 100 arrastras, worked by Mexicans. But the owners were satisfied with following the rich ore on the hanging-wall to such depth as they could hoist the ore in a crude way by hand. They never cross-cut to the west for a large body of ore now being worked by the present company. The work of sinking is being pushed as fast as three shafts can do it, with a general improvement in the character of the ore. The new double compartment shaft is now down 60 feet, and making about 15 feet per week. Hoisting-works will soon be in operation. The mill is being reconstructed, and ten more stamps added, making twenty in all.

MONO COUNTY—BODIE DISTRICT.

The companies mentioned had cash on hand July 1st as follows:

Bodie	$30,000.65	Mono	$21,161 99
Bulwer	4,462.57	Standard	38,332 96
Dudley	1,748 00	Syndicate	11,429 65

STANDARD CONSOLIDATED GOLD MINING COMPANY.—Official advices to us state that the production for June amounted to $35,739.21.

COLORADO.

ARAPAHOE COUNTY.

COLORADO ORE SAMPLING COMPANY.—The works of this company, which have been destroyed by fire—as mentioned in our last issue, will be rebuilt immediately. Through courtesy extended them by the Denver Ore Sampling Company, there will be no interruption of their business. They are receiving, sampling, and selling ores as usual.

CLEAR CREEK COUNTY.

ALICE MINING COMPANY.—This company has started up work at its placer mine, and is also running a stamp-mill erected last fall, crushing ore from its lode near the mill.

ALPS SILVER MINING COMPANY.—This company's property will be sold by the sheriff, at Georgetown, on the 29th inst.

COLORADO CENTRAL CONSOLIDATED MINING COMPANY.—Official advices to us state that the output for June amounted to 76 tons, which sold for $15,673.67. The force of men working in the upper levels have been put to work on the 750-ft. level to push development for the purpose of getting under the big ore-body below the 650-foot level. This work will be pushed and continued 150 feet further west, when work on the ore-bodies in the upper levels will be resumed. For the next two months no "big" increase is expected.

DUNDERBERG MINING COMPANY.—The committee appointed by the bondholders of this company are taking steps to reorganize.

EAGLE COUNTY.

IRON MASK.—The sale of this mine, to which we referred in our issue of April 9th and later, has been completed in London.

GUNNISON COUNTY.

LEGAL TENDER MINING AND MILLING COMPANY.—The twenty-stamp mill was to resume operations on the 11th inst. All the machinery is in good repair, and the mines are yielding an increased output.

LAKE COUNTY.

The Leadville *Herald-Democrat* reports the following:

A Y AND MINNIE.—The production for June was 2500 tons. It is now probable, if not certain, that this mine paid its owners the largest profit of any mine in the camp for the past month.

IDEAL MINING COMPANY.—The difficulties of this company continue to increase. Four judgments were rendered on the 8th inst. against the company, and the attachments sustained. The amounts were: John Harvey, $991.89; Manville Smelting Company, $1396.76; A. Sherwin, $1874.74, and Charles Boettcher, $1974.37, aggregating $6237.76.

LEADVILLE CONSOLIDATED MINING COMPANY.—The work is mostly confined to prospecting, but little mineral being shipped at present.

ROCK HILL CONSOLIDATED MINING COMPANY.—This company has not yet commenced work on its properties, the Vermont and Jay-Eye-See lodes. The shaft is down nearly 500 feet, and makes considerable water. To further sink it will require the enlargement of the shaft and good pumping machinery.

SMALL HOPES CONSOLIDATED MINING COMPANY.—The shipment of iron ore from a large body that lies between the Hood and Results shafts has begun. The body of this mineral has a face of about 50 feet and is being extracted more with the expectation of getting a high-grade ore in the developments than in realizing extensively from the iron, although it is of a grade sufficient to net $10 per ton.

PITKIN COUNTY.

ASPEN MINING and SMELTING COMPANY.—The company expects to add 100 men to its force within the next thirty days. The intention is to push development work preparatory to extensive shipments by September 1st, when the railroad is looked for at the mouth of Frying Pan.

SUMMIT COUNTY.

QUEEN OF THE WEST MINING COMPANY.—This property is about paying expenses, and will not be in position to do better for about three months, until certain connections have been made. The mine is shipping some mineral, but not an average of a car-load a day. The improvements to the machinery plant are being placed in position.

DAKOTA.

LAWRENCE COUNTY.

AMERICAN TIN MINING COMPANY.—It is stated that the affairs of this company have been satisfactorily arranged, and that work on an extensive scale will shortly be inaugurated.

CALEDONIA GOLD MINING COMPANY.—It is reported that important developments have been made at this mine. The main shaft has attained a depth of more than 500 feet, explorations made show a large body of pay-ore, and the company has decided to erect forty additional stamps, which will increase the milling capacity to one hundred stamps, and enable the company to handle about ten thousand tons of ore a month.

GALENA SMELTING COMPANY.—The company has contracted for 200 tons of ore from the Rutherford B. Hayes, and is negotiating for more ores from other mines. Fires were to be started at the smelter on the 8th inst., but the works will not begin operations until the 15th inst.

IRON HILL MINING COMPANY.—This company has put a small hoisting engine over the shaft it has been sinking on a vein situated about 400 feet south of the main working shaft. This shaft is now about 40 feet deep. A considerable quantity of ore has been taken out. The ore is between three and four feet in width at the bottom of the shaft.

IDAHO.

ALTURAS COUNTY.

KING OF THE WEST.—The erection of the hoisting-works is almost completed. When the mine has been drained the extraction of ore will be resumed By the first of August, at the latest, the first load of shipping ore will be in Hailey, and regular shipments will follow.

LEMHI COUNTY.

KIRTLEY CREEK.—These placer diggings, located seven miles from Salmon City, have sold for $27.000. They embrace a considerable tract of ground—almost 320 acres—and have proved reasonably rich with disadvantageous machinery, worked on a small scale. Surveyors are now at work marking out the line for an extensive ditch, the water for which is to be taken out of the Lemhi River near the agency, and thence carried along some fifteen or sixteen miles. The ditch, as it is proposed to be constructed, will cost about $100,000.

VIOLA COMPANY, LIMITED.—This company owns the Viola mine, which, like all others upon the mountain where it is located, consists of deposits. A Salmon City company owns the Viola Extension. Into this the Viola Company broke, so as to unite the shafts of the two companies. The Salmon City company sued the Viola for trespassing upon its territory, and the latter company retorted by suing the former and claiming the whole of the Salmon City's ground on account of the apex of the Westmorland, which they subsequently purchased for $10,000. The ore in the Viola Extension is said to be the richest that has yet been found on the mountain.

SHOSHONE COUNTY.

WARDNER MILLING AND MINING COMPANY.—The tunnel on the Viola is already driven in 375 feet. The indications are said to be of such a nature that this will be one of the finest properties on the Wardner belt. A body of rich ore has been struck. Superintendent McAuley has brought into use on the tunnel a new kind of an air injector, called a water-blast, which drives the foul air and powder smoke out of the tunnel. It is cheap and effective, being simply a body of water falling down a 30-foot chute into an air-tight box or tank, which is gauged so as to fill but half full of water. In the upper half of the box the air coming down with the water becomes compressed, and an air pipe conducts the cool and fresh air into the end of the tunnel.

ILLINOIS.

ST. LOUIS CONSOLIDATED COAL COMPANY.—This company is negotiating for the purchase of the coal mine of Mr. John Klces, on the Illinois & St. Louis Railroad, near West Belleville. The price is said to be $40,000.

MASSACHUSETTS.

PLYMOUTH COUNTY.

The gold mine at Abington, which created great excitement at that place some time ago (see ENGINEERING AND MINING JOURNAL, July 31st, 1886) has again been brought out. Press despatches state that the new developments are such that it has created a renewed interest in this undertaking. Mr. A. A. Harrigan has, by persistent effort, interested a New York capitalist in this enterprise, and he has received the promise of financial support until the ledge for a distance of 100 feet has been thoroughly tested. Work was abandoned at this place a few months since, and the property of the old company attached, but this new company proposes to investigate more thoroughly than ever the whole locality. The ledge where present work is being prosecuted is a continuation of the one where gold was first discovered, and work will be continued in that direction.

MEXICO.

It is stated that a New York company has purchased 250,000 acres of land in the State of Nuevo Leon. The land comprises some of the best mining and grazing lands in the State.

MAGISTRAT.—This copper mine, about thirty miles north of Chihuahua, has been bonded to an English company at $6000 per month for six months. After the expiration of this bond they have an option on the mine for $600,000. The mine is being worked for all it is worth, and the ores are being sent to England, *via* El Paso.

ST. LOUIS & MEXICAN IMPROVEMENT COMPANY.—Notwithstanding the flattering report made by Superintendent Rickard recently, it has been found necessary to raise funds to prosecute the search for ore to set the machinery at the mine at work. Every thing but ore has been secured. It has been decided to issue bonds to the extent of $100,000, and of which only $50,000 will be placed at present. The remaining $50,000 is to be reserved and drawn on only in the case of necessity. The bonds will bear 8 per cent interest, payable half-yearly, and will be sold at par. With each $1 bond subscribed for the purchaser will receive a bonus of one share of stock, so that the placing of $50,000 bonds means placing, also, 50,000 shares of stock. Upward of 15,000 of the bonds have already been subscribed for. The above plan for securing the required funds is not by any means agreeable to all of the stockholders. Many of them criticise very strongly the management of the property, and feel unable to bring themselves to view with complacency the new debt-involving scheme. Had the money, they say, which has been expended in costly and extravagant machinery and supplies, been expended in endeavoring to secure some ore, it would have been better mining and more business like. They also recognize that the so-called treasury stock is stock for which the company still owe $1 per share, and this, with the bonded debt, will be an incumbrance of no small proportions. The 50,000 shares of stock which were put on the St. Louis market a few months ago were placed with the company to be sold out, but paid for at the rate of $1 per share, and that debt, by stipulation, takes precedence of any other obligation.

MICHIGAN.

COPPER MINES.

The following statement gives the product in "Mineral," carrying about 75 per cent copper, of the

mines mentioned for June and for six months of 1887, and a comparison with the outputs of the same mines in the two preceding years:

	June.			Jan. 1 to June 30.		
Mines.	1887. Tons.	1886 Tons.	1885. Tons.	1887. Tons.	1886. Tons.	1885. Tons.
Calumet & Hecla	2,840	2 843	2,670	15,808	16,092	14.870
Tamarack	350	202	....	1,837	1,198	....
Quincy	210	276	270	1,328	1,373	1,293
Atlantic	202	193	212	1,204	1,216	1,122
Franklin	201	201	190	†1,190	1,139	1,192
Osceola	*165	165	....	†931	1,006	889
Huron	....	90	115	357	667	682

* Estimated. † One month estimated.

ALLOUEZ COPPER MINING COMPANY.—The mine is reported as looking very rich in copper at the sixteenth level. Two heads of stamps are in use at the mill, stamping about 350 tons of rock per day. So far this season the mill has had no trouble from lack of water—a cause of much annoyance last year.

CALUMET & HECLA MINING COMPANY.—The Calumet & Hecla's output for June is noticeably large, averaging 118 tons per working day—one of the best records in the history of the mine. Added facilities and improvements now making in stamp mills and rock houses doubtless will result in an even larger product henceforth.

HURON MINING COMPANY.—There is again no report made for June from this mine, which also has suffered from fire; but rebuilding of the stamp-mill has been so far completed that operations at the mine probably will be resumed this week. During the suspension of stamping, work on the openings of the mine has continued, and the ground continues to look very promising. It is stated that the company is negotiating for the purchase of the Nonesuch mine machinery, including the stamp machinery.

QUINCY MINING COMPANY.—The June product is comparatively small, owing to the late fire but the new drumhouse is nearly completed, with other repairs, and the running of rock direct to the mill probably has been resumed by this time. Not much diminution in the year's product is expected to result from the fire.

TAMARACK MINING COMPANY.—The Tamarack during the past month made the best monthly output in its history, and from now on may be expected to show increasing products.

GOLD AND SILVER MINES.

ONTONAGON & SUPERIOR.—The parties who have an option on this old silver mine are putting the stamp-mill in order, so that one battery of heads can be used for the purpose of making a test on the vein rocks on a larger scale, in order to determine the value more definitely.

IRON MINES.

STURGEON RIVER IRON COMPANY.—Further particulars of the disaster at this mine, on the 7th inst., to which we referred in our last issue, shows that fifteen men were blasting, and that seven came up the shaft after the charge was fired. The others, who were green men, and all Italians, lingered in the mine, and were caught in the tremendous rush coming from an opened vein. After twenty-four hours' pumping the bodies were recovered. The Coroner's inquest exonerates the company from blame, it having been shown that the means of egress were ample.

MONTANA.

The following statement shows the amount of gold and silver bullion handled in the United States assay office at Helena for the fiscal year ended June 30th, 1887. Gold, $1,313,426.79; silver, $98,483.50, total, $1,411,911.29.

CHOTEAU COUNTY.

It is now well understood that Mr. James J. Hill and associate capitalists, says the Great Falls *Tribune* will build works at the falls of the Missouri for reducing and refining gold and silver ores immediately on the completion of the Manitoba railway to Great Falls. It is not, however, generally known that these works are to be on a scale of great magnitude, and will be the most extensive and complete works on this continent for the treatment of ores.

It is stated that Great Falls is superior to all other places in the West for this business: I. Because it has an immense and unfailing water-power. II. Because it has an almost inexhaustible supply of coking coal, iron ore and limestone. III. Because, having an altitude of 3300 feet, the ore from all the mining districts of a vast mineral region can be delivered to it at the lowest price per mile known to railroad traffic.

DEER LODGE COUNTY.

SAN FRANCISCO CONSOLIDATED MINING COMPANY.—Reports state that a rich strike of ruby silver has been made 112 feet below the tunnel, the vein cross-cutting from east to west. A meeting of the St. Louis syndicate has been held to consider the propriety of authorizing a call of an additional 25 cents so as to provide for the development of the strike.

LEWIS & CLARKE COUNTY.

STERLING GOLD MINES LIMITED.—Operations have begun at this mine, which has recently been purchased by an English company. The shaft is down 200 feet. The ore is gold-bearing and free milling. There is a ten-stamp mill on the property and another of a capacity of thirty stamps will be erected at once. Mr. R. B. Wallace takes charge as superintendent.

MEAGHER COUNTY

HUDSON MINING COMPANY.—This company, at Neihart, has shut down. The cause is said to be the failure of the process to save the silver. The concentrator is a success, but the character of the ore does not seem to be adapted to concentrating, the silver floating off with the water. A stamp mill and the dry process is now said to be the only one for the treatment of this company's ores.

SILVER BOW COUNTY.

LEXINGTON MINING COMPANY.—Official advices to us report the production for June to have been as follows: Gold, $11,200; silver, $69,600. Total, $80,800.

NEVADA.

ELKO COUNTY.

The companies mentioned had cash on hand July 1st, as follows:

Belle Isle	$6,989.93	Independence	7,964.17
Diana	3,336 80	Navajo	†13,164.15
Elko Cons	1.748.90	North Belle Isle	*35,443.54

† Drafts outstanding, $250.75.
* Add bills receivable, $25.000. Drafts outstanding, $4.64.

Nevada Queen had an indebtedness July 1st of $25,000.

JUNIPER CONSOLIDATED MINING COMPANY.—This company is in need of from $15,000 to $20,000 to carry on work. There are still 20,000 shares of treasury stock, and it has been decided to sell them at 50 cents a share. About 11,000 shares have already been subscribed for by the stockholders. About 50,000 shares are held in St. Louis. We referred to the operations of this company in our issue of March 12th.

EUREKA COUNTY.

EUREKA CONSOLIDATED MINING COMPANY.—July 1st, this company had cash on hand amounting to $45,200.

STOREY COUNTY—COMSTOCK LODE.

We take the following from the Virginia City *Chronicle:*

The financial balances of the various Comstock mining companies on July 1st were as follows:

CASH ON HAND.

Alpha Con	$8,666.82	Kentuck	1.186.76
Alta	54.3 8.21	Lady Washington	18,273 67
Belcher	2,100.59	Mexican	1,868.69
Bullion	11,217.89	Occidental	363.59
Benton Con	20,422.76	Orleans	477.60
†Con. Cal. & Va.	200,024 30	Overman	23,112 45
Challenge	14,881.96	Sierra Nevada	11,403.99
Crown Point	20,569.94	Scorpion	7,174.57
Exchequer	5,682 16	Union Con.	
Imperial	2,938.99	Utah Con.	7,318.20
Julia	3,862.04		

† Cash in bank and unsold bullion on hand of the assay value of $190,428 53. The final shipment representing the clean-up for the month of June will be made to-night, and will exceed $100.000. The total amount of cash and bullion on hand July 1st, after disbursing the dividend declared to-day, will be $3 3,080, gold value.

INDEBTEDNESS.

The following companies report having an indebtedness July 1st, 1887.

Best & Belcher	$12,235.48	Ophir	1,503.05
Chollar (overd'ft)	10,571.73	Potosi (overd'ft)	11,093.58
Gould & Curry	594.11	Savage	79,433.88
Hale & Norcross	16,625.92		

ALTA MINING COMPANY.—Grading for the site of the ten-stamp mill to be erected at this mine is completed, and the laying of the foundation begun. It is expected the mill will be ready to crush ore early next August.

CHOLLAR MINING COMPANY.—A cross-cut started east from a point in the lateral drift 100 feet south of the Hale & Norcross line penetrated a belt of clay similar to that cut on the west side of the ore development made in the latter mine. When connection is made between the 1300 level of the incline and the vertical shaft a series of cross-cuts will be sent in to the east from the south lateral drift on the 1300 at intervals of 100 feet apart. The west drift from the 200 level shaft station is cutting quartz fertile in mineral, which is thought to be the rim of the downward extension of the ore development on the tunnel level.

CONSOLIDATED CALIFORNIA & VIRGINIA MINING COMPANY.—The official report of Superintendent Patton, dated the second inst., shows that they have reached and cut through the incline bulkhead on the 1600 level, where the fire broke out last December, and find that the fire is extinguished. Have begun to retimber the 1600 south drift from Ophir shaft preparatory to resuming active operations at that point, and opening the bulkhead on the 1750 level. During the week, 931 tons of ore were shipped to the Morgan mill, 1596 tons to the Eureka mill. The average assay value of all the ore worked at both the above mills during the week, according to battery samples, was $34.97.

CROWN POINT MINING COMPANY.—The indications are flattering that the high-grade ore development made in the winze below the 230 level extends downward to the 400 level, which is now being opened up by a south drift.

GOULD & CURRY MINING COMPANY.—The bodies of the six miners who were imprisoned in this mine on the 24th ult., as mentioned in our issue of the 2d inst, were found on the 11th inst. Operations have been resumed at all points on the 400, 625 and 800 levels, where explorations were in progress prior to the fire in the shaft station on the 1500 level. The shaft is being repaired below the 1300 level.

SAVAGE MINING COMPANY.—The fertile quartz belt, noted in our last issue, having been entered by a west cross-cut sent out from the shaft station, developed into ore when in about 100 feet. It is now showing a breadth of 20 feet of fair grade ore.

NEW JERSEY.

SUSSEX COUNTY.

SHERMAN.—Messrs. Cooper & Hewitt have opened the old iron mine, known as the Sherman, on the mountain above Sparta, where work had been suspended for a long time, as the ore was not considered valuable enough to warrant working. Since Messrs. Cooper & Hewitt have gained possession they have found a rich vein. The samples shipped by them, it is said, have given a high per cent of iron; they expect to ship 50 tons per day to their furnaces.

OHIO.

WOOD COUNTY.

HANKEY SAND COMPANY.—Oil was struck on the 11th inst. at Henry township, at a depth of 1140 feet. For the first few hours the well produced at the rate of 100 barrels per hour.

OREGON.

COOS COUNTY.

The coal mines at Newport are again being worked. It is said to be the only mine exporting coal from Oregon at present. The shut down was caused by litigation, which is now settled.

PENNSYLVANIA.

COAL.

ALEXANDRIA COAL COMPANY.—This company has let contracts for the erection of 220 new coke ovens and forty houses at its works at New Alexandria. Nearly 200 men are now employed, and the force will be considerably increased in the near future.

PHILADELPHIA & READING COAL AND IRON COMPANY.—At the Otto, one of the best collieries of this company, located at Branchdale, seven miles west of Pottsville, a fire was discovered on the night of the 10th inst. It had, it is believed, ignited from the steam-pipes which worked the inside pumps. An effort was first made to smother the fire with steam, but this was without success. The neighboring stream was dammed and a fire steamer was brought from Minersville. Twelve hundred feet of hose were required to reach the mouth of the slope. Another stream was diverted and coal dirt was washed into the airway to cut off the fire from the Primrose and Mammoth veins. It is thought that the fire is under control.

The mine shipped 100 cars a day, and it is feared will now be idle six months at least.

NATURAL GAS.

J. M. Guffey & Co. brought in another large gas well on the 11th inst., four miles north of Greensburg, on the Salem road. The well is now gushing out a great stream of water forty feet above the derrick. It is said to be an important strike, as it extends the Grapeville District our miles east of the present boundaries.

OIL.

Exports of refined, crude, and naphtha from the following ports, from January 1st to July 9th:

	1887. Gallons.	1886. Gallons.
From Boston	2,453,830	2 884,370
Philadelphia	78.953,472	72.923,774
Baltimore	4,314.170	7,988.900
Perth Amboy	8.915,001	1.593,770
New York	189,729,562	199,388,438
Total exports	284,366,035	284,779,252

The Chief of the Bureau of Statistics reports the total values of the exports of mineral oils from the United States for the month of June, 1887, and during the twelve months ended June 30th, 1887, as compared with similar exports during the corresponding periods of the preceding year, as follows: June, 1887, $4,224,019, June, 1886, $4,568,436; twelve months ended June 30th, 1887, $45,423,474; twelve months ended June 30th, 1886, $49,478,649. These exports comprise about 99 per cent of the total exports in mineral oils.

SHANOPIN OIL COMPANY, LIMITED.—A controlling interest in this company, whose territory and plant is about twenty-two miles from Pittsburg on the Pittsburg & Lake Erie Railroad, has been sold to James Amm and others, of Bradford, for about $275,000. The production of the Shanopin Company has been about 400,000 barrels of crude petroleum a year.

STANDARD OIL COMPANY.—An ejectment suit involving the possession of this company's refining works in Titusville has been started. When the Standard first located their refineries there, finding that they could not purchase outright a suitable location, they leased for a term of twenty years, at an annual rental of $600 a year, twenty acres of land situated south of the city, along the banks of Oil Creek, of R. D. Fletcher. In the lease a forfeiture clause was inserted giving Mr. Fletcher the right to hold all improvements made upon the land at the expiration of the lease should the Standard allow the rental day to go by. This lease was brought to a termination a few weeks ago by some misunderstanding, and on the Standard's failure to pay the yearly rent Mr. Fletcher immediately brought an injectment suit to get possession of the property and its improvements, which are valued at many thousands of dollars.

TENNESSEE.

KNOX COUNTY.

A company has been organized to bore for natural gas about 22 miles from Knoxville.

UTAH.

The bullion receipts at Salt Lake City for the first half of this year, according to the *Tribune*, amounted to $2,439,078.92.

SALT LAKE COUNTY.

NEW EMMA MINING COMPANY.—The New Emma is the first of the Alta properties to be recorded as a shipper this season, says the Salt Lake *Herald*. Thirty tons of high grade ore came down over the tramway, and was sold in Salt Lake City during the week ending the 3d inst.

SUMMIT COUNTY.

ANCHOR MINING COMPANY.—This company is now receiving proposals for the construction of a Drain Tunnel, commencing near the Empire Hoisting-Works, a distance of about 6000 linear feet. Size of tunnel, inside of timbers, four feet at cap, five feet at sill; seven feet high.

DALY MINING COMPANY.—During the first six months of this year the company produced 546,706·70 ounces of fine silver, and received from ore sales $102,770.47, aggregating in all about $649,447.17.

ONTARIO SILVER MINING COMPANY. This company has produced during the first six months of this year 581,948·62 ounces of fine silver, and received from ore sales $385,672.69, making a total of about $967,-621.31.

SOUTHERN TIER MINING COMPANY.—Some time ago it was announced that an extensive deposit of high-grade ore had been uncovered in this mine, at Park City. A shipment of twenty-six tons of ore has just been made, assaying forty-four per cent lead, one hundred and sixty-five ounces of silver, and sixty cents gold, and purchased for the Germania Lead-Works. It is stated that other shipments of ore, of a higher grade than the above, will soon follow.

TOOELE COUNTY.

HONORINE MINING COMPANY.—This company still continues to hold its output, a 300-ton lot being on the Salt Lake market and awaiting a favorable price. The smelters claim that the company want more than the ore contains.

WAHSATCH COUNTY.

BLACK DIAMOND MINING COMPANY.—This company, which was organized some months ago, as mentioned in our issue of April 9th, has contracted with some parties to drive a tunnel 100 feet for $5 a foot and take stock in payment for the same at 15 cents a share.

WASHINGTON COUNTY.

STORMONT MINING COMPANY.—Official advices to us report that work at the mine has developed nothing new during the week. The cross-cut toward 8th level is still in bottom vein rock; total length, 48 ft. The 7th level south is bearing away from the bottom ledge in order to prospect the top vein, and is consequently showing less ore. Total distance of level south from main incline, 425 ft. Distance to connection with 6th south stope, 140 ft. The air shaft will be about 25 ft. through. Total depth now, 12 ft., and a drill hole is being put down through to drain it.

VIRGINIA.

STAFFORD COUNTY.

RAPPAHANOCK GOLD MINING COMPANY.—This company is at present working ten stamps night and day. Ten additional stamps are being put in and will soon be in operation.

WEST VIRGINIA.

JEFFERSON COUNTY.

During the past two months a Pittsburg, Pa., company has been boring for natural gas at the old springs, eight miles above Charleston, on the Kanawha River. On the 9th inst., a fair flow was struck at a depth of 1800 feet. Work was stopped owing to the fact that the flow was so great as to blow the instruments out of the well.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, July 15.

Statistics.

Production Bituminous Coal for week ended July 9th, and year from January 1st:

Tons of 2000 pounds, unless otherwise designated.

EASTERN AND NORTHERN SHIPMENTS.

	1887. Week.	1887. Year.	1886. Week.	1886. Year.
Phila. & Erie RR....	430	6,429	.....	7,507
*Cumberland, Md..	46,507	1,446,026	65,671	887,514
*Barclay, Pa.....	3,130	108,522	3,356	103,596
*Broad Top, Pa.				
H. & Broad Top RR.	3,090	179,664	6,539	193,528
East Broad Top....	.....	.....	.....	.....
Clearfield Region, Pa.				
Snow Shoe	2,419	87,178	3,167	46 700
Karthaus (Keating)	3,645	100 009	1,974	59,950
Tyrone & Clearfield	42,583	1,669.521	55,182	978,300
Tipton.....	20	4,733	.....	.....
Alleghany Region, Pa.				
Gallitzin & Mountain	9.387	551,594	2,275	406,381
Pocahontas Flat Top Coal.				
Norf'k & West. RR..	15,585	601,232	15,549	415,659
Kanawha Region, W. Va.				
Ches. & Ohio RR..	19,527	715,265	16,012	596,519
Total.....	146,323	5,471,073	169,735	3,695,654

* Tons of 2240 lbs. † Estimated. ‡ Week ending July 7th.

WESTERN SHIPMENTS.

Pittsburg Region, Pa.				
West Penn RR.....	4,339	162,479	5,003	175,875
SouthwestPenn.RR.	866	68,379	1,276	98,700
Pennsylvania RR...	3,246	111,543	4,964	131,357
Westmoreland Region, Pa.				
Pennsylvania RR...	27,382	765,532	29,155	526,603
Monongahela Region, Pa.				
Pennsylvania RR...	4,095	207,356	8,531	199,375
Total.....	39,919	1,315,289	48,929	1,131,970
Grand total.....	186,242	6,786,362	218,764	4,827,624

Production Anthracite Coal for week ended July 9th, and year from January 1st:

TONS OF 2240 LBS.	1887. Week.	1887. Year.	1886. Week.	1886. Year.
P. & Read. RR. Co..	116,233	3 961,294	204,092	5,428,851
Cent. R. R. of N. J.	89.053	2,493,589	*	*
L. V. RR. Co.... †	149,012	3,643,9 9	101.830	3,038,071
D., L. & W. RR. Co.	77,071	2,663.615	75,438	2,523,264
D. & H. Canal Co..	61,114	1,890 579	61,869	1.857,088
Penna. RR.....	48,314	1,572,973	44,0 9	1,570,889
Penna. Coal Co.....	24,807	713,192	24,411	645,513
Penna. Canal Co...	12,520	153,433	11,436	169,422
Tota	578,124	17,092,604	523,117	15,233,098
Increase	55,107	1,859,606	....	.....
Decrease	.....	.....	....	.....

* Included in tonnage of Philadelphia & Reading RR.
† Production for the eight days ending July 9th.
The above table does not include the amount of coal consumed and sold at the mines, which is about six per cent of the whole production.

Production for corresponding period:

1882.....	13,901,634	1884.....	14,694,861
1883.....	14.712,252	1885	13,886,292

Production of Coke on line of Pennsylvania RR. for week ended July 9th, and year from January 1st. Tons of 2000 pounds.

	1887. Week.	1887. Year.	1886. Week.	1886. Year.
Tyrone & Clearfield	...	1.735	.....	.....
Allegnany Region.	4,174	127.979	1,319	99,202
West Penn. RR....	1,633	59,162	1,769	54,187
Southwest Penn.RR	19,079	1,253,199	48,004	1,306,638
Penn. & W. Region	4,602	144.830	6,617	171,101
Monongahela	.....	60,092	3,215	67,467
Pittsburg Region.	....	....	.....	.....
Snow-Shoe..... .	1,090	27,283	725	10,594
Total.....	30,578	1,674.280	61,649	1,709.189

Anthracite.

The coal trade is in a very fair condition generally, orders coming more freely from the East and West, from all quarters except the city, where business is dull. The sales agents held a meeting yesterday, but as some of the companies were not represented, nothing was done; the general expression of opinion was that an advance in prices would be called for in August.

Among the consumers universally and the trade quite frequently the opinion is expressed that the companies will be wise to let well enough alone, and to keep prices where they are for some time. It is pointed out that they are now extremely remunerative, and that an advance would be unjust, for it would not be shared with the miners. We incline also to the view that it is not desirable to advance much, though the probability is that from 10 to 25 cents a ton will be added in August to present prices.

The Pennsylvania Coal Company has advanced its prices at Newburg 10 cents on grate, stove, and chestnut, and 15 cents on egg coal. The *net* prices, ex commissions, are now as follows: Lump, $3.55; Grate, $3.45; Egg, $3.60; Stove, $4; Chestnut, $4; Pea, $3.05; Buckwheat, $2.05. Comparing these prices with the regular *net* prices f.o.b. in New York harbor, and counting that it costs 15 cents a ton freight from Newburg down, and it appears that for New York delivery the Pennsylvania Coal Company is asking 30 cents more on lump, 20 cents more on grate, the same price for egg and stove, 30 cents more for chestnut, 20 cents more for pea and 5 cents more for buckwheat than the other companies are getting, and as the company states that its order books are well filled, we may look for an advance by the other companies to at least a corresponding degree shortly.

The Canadian trade is considered very satisfactory.

The building of the Poughkeepsie bridge is looked forward to with interest in the Eastern trade, as it will permit all rail coal to get to many Eastern cities at prices much lower than are now possible.

We continue our quotations for standard free burning coals, *net* prices, f.o.b. vessels New York shipping ports:

Lump.....	$3.40
Steamboat.....	3.40
Broken.....	3.40
Egg.....	3.60
Stove.....	4.00
Chestnut.....	3.85
Pea.....	3.00
Buckwheat	2.15
Dust.....	1.57

Bituminous.

There is nothing new to record or to expect for some time in this department. This is the dull season and the companies are all busy filling contracts at present prices, and hoping for a little more profit later on. The railroads have taken the greater part of the advance on last year's prices, though present rates still leave a fair margin to those who are accustomed of late years to do business without any profit.

We repeat our quotations as follows:

"F.o.b. at Philadelphia, Norfolk, Newport News, Baltimore, and Georgetown, $2.60 per ton of 2240 pounds.

"F.o.b. at South Amboy, Perth Amboy, and Weehawken, for shipments to points on the Hudson River north of 57th street, and to points on the East River east of Hell Gate, $3.15 per ton of 2240 pounds.

"F.o.b. at Elizabethport and Port Johnson for shipments to points on the Hudson River north of Fifty-seventh street, and to points on the East River east of Hell Gate, $3.05 per ton of 2240 pounds.

"F.o.b. at South Amboy, Perth Amboy, Elizabethport, Port Johnson, and Weehawken for shipments to points on the North River south of Fifty-seventh street, and to points on the East River west of Hell Gate, $3.25 per ton of 2240 pounds.

"Delivery alongside in New York harbor, south of Fifty-seventh street, New York, and on the East River, west of Hell Gate, $3.50 per ton of 2240 pounds."

Prices for steamer coal at Baltimore and Philadelphia, $3.50 per gross ton trimmed into steamer's bunkers.

Boston. July 14.

[From our Special Correspondent.]

The market for anthracite coal looks well from this point of view. It continues on the mend and a fair amount of orders are being sent forward. No definite sign seems to have been given as to whether an advance will be made during this month or not. F.o.b. prices are well maintained at present quotations.

The bituminous coal trade continues very quiet, and without features of interest. A fair quotation for the outside coal is $3.85@$4 delivered, but the pool price is steady at $2.60 f.o.b.

The most interesting feature to the coal trade just now is the freight outlook. I may be wrong in anticipating lower rates, and it is but fair to say that the trade generally think that the shipping activity will be sufficient to fully maintain rates for the rest of the summer season. At the same time the increased and increasing barge tonnage must not be overlooked. The Boston Tow Boat Company is putting its recent increase of capital from $300,000 to $800,000 into the development of its coal-carrying business. Their equipment in this line has already increased from two barges and a tug to nine barges and several tugs. The latest addition, as some of your readers may have seen, is the Lone Star, formerly of the Morgan line of steamers. She has been razed to the main deck, and carries 2600 tons on 17 feet draught. She can carry 3000 tons on 18 feet. She is run as a barge, but will be fitted with masts and rigged to spread 3,000 yards canvas. This is no unimportant addition to the plant of this company; but in addition it is building a steam collier of 2500 tons on 18½ feet draught, and capable of towing two barges at the same time; it is estimated to cost $200,000. This collier will be of the best build, and rated by the Lloyds when completed. A second collier on the same model is now being contracted for. In addition to the ambitions of this company in this direction, the Philadelphia & Reading people are to put the barges which they have just acquired by purchase of the Eastern Transportation Company on Boston coal carrying, although these barges will probably run to this port only in the summer. Cape Cod Canal or not, it looks as if barges were getting the better of schooners in the wrestle for coal freights.

We quote, exclusive of discharging: New York, 85@90c.; Philadelphia, $1.05; Baltimore, $1.15; Newport News and Norfolk, $1.05@$1.10.

The situation among retailers is not all that is hoped for. It is expected that the advance will become effectual, however.

We quote delivered prices as follows:

White Ash Stove, $5.75@$6; Egg, $5.50@$5.75; Broken, $5.25@$5.50; Lorberry, $7; Franklin, $7.50.

Wharf prices are as follows: Broken, $4@$4.25; Egg, $4.50@$4.75; Stove, $4.75@$5.

Buffalo. July 14.

[From our Special Correspondent.]

Through a misunderstanding, the following changes in anthracite coal quotations were not sent you; they went into effect July 1st. Grate advanced 20c. and and egg 10c. per gross ton wholesale, and 15c. and 5c. respectively per net ton retail. Stove, chestnut, and No. 4 sizes unchanged.

The following is the schedule published:

PER 2240 POUNDS, SUBJECT TO USUAL CONDITIONS.

SIZES.	On cars for Buffalo dealers and pea on board vessels at Buffalo.	On cars delivered at Buffalo and bridges for shipment West	Retail per 2000 pounds screened and delivered.
Grate.. ...	$4.50	$4.20	$4 75
Egg	4 50	4.20	4.75
Stove.....	4.75	4.45	5 00
Chestnut...	4.75	4.45	5.00
Pea	.....	.....	4.25

Business in anthracite is picking up here at retail, and wholesalers say that the Western demand is simply immense. The dealers are a happy set of men at last.

Bituminous trade still hangs fire, but operators say that they can see the silver lining in the clouds, and their expectations are of a buoyant character.

The applicants for natural gas are legion, and the greatest activity prevails among the officials and workmen of the company.

For some time past malsters, and brewers who are malsters as well, have been allowed a concession on schedule anthracite coal prices by permission of the directors of the Coal Exchange here. It is understood that the reason for this departure was that the majority of the malsters' buildings can be reached by canals, and coal can be brought by the waterway more cheaply and handled at less expense. There was some kicking when this news was first made public, but the explanation seems to be satisfactory to the majority.

Bids for anthracite coal for the school department were opened on Monday last, and proved a surprise. There were 17 bidders, 16 of whom gave the following figures: $4.75 for grate and egg and $5 for stove and nut, whilst the other named $4.70 for grate and egg and $5 for stove and nut. No award was made under

the circumstances, and the uselessness of spending money in advertising for bids under the present conditions of the trade was made apparent. The bidders agreed to deliver the coal during July, August, and September, but after that date the price would be subject to the changes made by the Coal Exchange. Twice the $4.70 man has backed out!

Coke is slow. The nominal quotations are $5.30 for Connellsville and $4.50 for Reynoldsville per 2000 lbs. on track. Daguscahonda coke out of the market.

Lake freights steady at unchanged rates. Stock of coal light and vessels scarce. The quotations were 100c. to Chicago, Menominee and Milwaukee, 110c. to Sheboygan and Racine, 75c. to Duluth, Superior and Washburn, 50c. to Bay City and Saginaw, 30c. to Detroit and Toledo, and 25c. to Sandusky.

The shipments of coal by lake from July 7th to 13th, both days inclusive, 41,880 net tons, namely: 14,730 to Chicago, 10,580 to Milwaukee, 2500 to Duluth, 1520 to Detroit, 4250 to Superior, 450 to Sheboygan, 350 to Port Huron, 1450 to Racine, 630 to Menominee, 730 to Washburn, 2560 to Saginaw, 230 to Bay City, 850 to Ashland, and 600 to Sandusky. Total for the season, 652,690 net tons, not including the shipments by Tonawanda vessels.

The Lackawanna's immense trestle is rapidly progressing toward completion. The mason work is done, the grading is nearly finished, and the timbers are being raised. Six million feet of lumber will be used. By the latter part of November probably the trestles will be utilized.

Last Thursday the mammoth propeller "Owego," constructed of steel, was launched here. Capacity, over 2800 tons, besides fuel; speed estimated at 16 miles per hour. Her keel length is 326 feet; extreme length, 352 feet; molded beam, 41 feet; molded depth, 25½ feet, between decks, 8½ feet. Total cost, about $300,000, inclusive of machinery, fittings, etc.

The experiments being made in all quarters to produce a cheap fuel for manufacturing purposes have attracted much attention here lately, and many interesting facts in relation thereto have been made public. It is evident that some new departure from established methods will be found before long which may leave natural gas behind in the race.

Pittsburg. July 14.

[From our Special Correspondent.]

Coal.—The firmness noted in our last continues here and in the lower markets. The low stage of water in the Ohio about two feet below Davis Island Dam detains a large number of empties below. There is very little coal in the pools ready for shipment. Should there be a July rise there is plenty of water in the harbor to bring coal from the pools.

The rates are: For Monongahela first pool, per 100 bushels afloat at mines, $4.50; second pool, $4.25; third pool, $3.65; fourth pool, $3. Railroad coal held $5 per 100 bushels.

Connellsville Coke.—None for sale at this writing. Of course the article has no market value under the circumstances.

MARKETS.

NEW YORK, Friday Evening, July 15.

Prices of Silver per ounce troy.

July	Sterling exchange	Lond'n Pence.	N. Y. Cents	July	Sterling exchange	Lond'n Pence.	N. Y. Cents
9	4.84	44 1-16	95⅜	13	4.84	44	95¼
11	4 84	44 1-16	95⅜	14	4.84	44	95¼
12	4 84	44	95¼	15	4 84	44 1-16	95¼

Foreign Bank Statement.—The governors of the Bank of England, at their weekly meeting, made no change in the rate of discount, and it remains at 2 per cent. During the week, the bank lost £143,000 bullion, and the proportion of reserve to its liabilities was raised from 38 35 to 40·55 per cent, against 39 1-16 per cent at the same time last year. On the 14th inst., the bank lost £34,000 bullion on balance.

Copper.—This metal has made quite a spurt during the week, and Lake has rapidly advanced from 10·40@10·60c. for Spot, and August sold to-day at 10·70c., while October commanded 10 80@10·85c. Casting brands follow Lake, though without excitement or speculative interest. Chili Bars are quoted to-day £39 15s. and B. S. £45. The Orford Copper and Sulphur Company has been placed in the hands of a receiver, and the sales of Chili bars in London a week ago, which were credited with depressing that market, were, it is said, on account of parties connected with this company.

Much sympathy is expressed for this company, and it is hoped that pending arrangements will be carried through and permit the business to be continued.

The event of the week has been the consolidation of the Mountain View and Montana Copper companies' properties in a company which includes parties interested in the Montana Company, Mr. Larabie, owner of the Mountain View, and Boston capitalists connected with the Tamarack and Osceola companies. This property has a developed length of about 5400 feet of copper-bearing ground, and the mines have been opened up very extensively, and have immense reserves of ore in sight, in fact, it is at present probably the finest copper property in this country, and could be rapidly brought into large production. This, however, is not the intention of the owners. The trade is in a much safer condition in having this immense and valuable property held in strong hands, which at the same time thoroughly understand the market and have shown by their management of the property that they will use it in a conservative manner.

In our mining news will be found the statement of the output of the principal Lake Superior mines. Thus far the Tamarack is the only company that has increased its output. A letter published on another page gives the output of the Montana mines.

The exports of copper from this port have been as follows:

		Lbs.	
To Liverpool—Matte:			
By S. S. The Queen—Bags	3,119	353,440	$17,672
" British Queen—Bbls	71	82,504	5,000
" England—Sacks	2,726	321,410	16,071
" Adriatic—Sacks	5,732	678,470	39,140
Germanic:—Copper.			
Cakes	1,342	60,480	7,200
Bordeaux:—Bars.			
Chateau Margaux	530	79 043	7,100
Hamburg:			
By S. S. Hammonia, 12 bars copper bullion			1,300
Amsterdam:—Casks.			
By S. S. Schiedan	18	22,500	2,550
Rotterdam:			
By S. S P. Caland—Casks	2	2.200	230

Tin.—This London market has again advanced. Cables to-day quote spot £104 and three months £103 5s. Here sales during the week have aggregated about 160 tons at prices which have ruled at from 23@23¼ for spot, and 22·60@22·85 for futures.

Lead.—This market is quite dull and the price keeps as near importation figures as may be. Western smelters are not offering and only a retail business has been done. As already stated, our prices will probably be governed by European quotations for some time to come, and these are now low. We quote at 4·45@4·50c. for domestic and foreign, 4·60c.

Manufactures.—Sheet lead is quoted at 7¾c. Pipe at 7c., less the usual discount of 20 per cent. Bar lead is 5¼c. Shot, 1·40c., being all as heretofore quoted.

White Lead is held at 6½@6¾c. gross for Eastern brands.

Messrs. Everett & Post, of Chicago, telegraph to-day as follows: Market quiet and dull, prices unchanged. Demand is only moderate and but very little doing. Offerings are small. Buyers expecting a decline are holding off and buy only for immediate want. Sales will not aggregate 250 tons at 4·40.

Messrs. John Wahl & Co., of St. Louis, telegraph to-day as follows: Market does not reveal any activity, but on the other hand shows no sign of weakness, holders having quite frequent inquiries for small lots, maintaining prices fairly well. It appears to be generally conceded that the market has touched bottom. Sellers not so weak as they were in the earlier part of the week. We may quote both hard and soft lead worth 4·30.

Spelter.—This metal continues quiet here. Domestic is quoted 4·55@4·60c., and Foreign 4·85@4·90c.

Cables to the Metal Exchange quote Silesian in London to-day, £14 12s. 6d.

Sheet Zinc is quoted 6½@6¾c.

Zinc Oxide is quoted 4@4½c., according to quality, for Domestic. French zincs are quoted 5⅝c., for Dry Antwerp Red Seal, and 7⅛c. for Dry Paris Green Seal, with the usual discounts.

Antimony.—This market is very strong, owing, as already reported, to the fact that all the antimony here is in the hands of two houses. We quote Hallett's at 8¾@8¾c. and Cookson's 9½c. Hallett's is quoted to-day in London at £35 by cable to the Metal Exchange.

Quicksilver.—The market is strong. We continue to quote $42 per flask, and 52½@53c. per pound; in London, £6 10s.@£6 12s. 6d. per flask.

Nickel.—We quote 65@70c. per pound.

Aluminum.—The German manufacturers are quoting $12@$14 per pound for aluminum; magnesium $4 per pound.

IRON MARKET REVIEW.

NEW YORK. Friday Evening, July 15.

Although there has not been much new business of moment, yet there has been considerable inquiry in various departments, and there is every indication that the summer will see continued great activity in all departments of the iron trade.

As pointed out last week in our financial article, the production of pig-iron in the United States for the six months of this year was in excess of three million tons—the largest product on record. In spite of this, stocks at the present time are very low—this enormous product has practically been consumed. Foundries and mills are still active, and there are apparently plenty of orders ahead. So that, although we are now in the midst of the usual July dullness, there is every reason to reaffirm the opinion which we have frequently expressed, that the outlook in all departments of the iron trade is excellent. The year 1887 will, beyond doubt, show the greatest volume of trade in iron and steel ever recorded.

Prices, however, are practically unchanged. Our manufacturers have apparently learned the wisdom of avoiding "booms," which have in the past resulted so disastrously in bringing in a flood of foreign iron, and in tempting idle capital to embark largely in the iron business. Present importations, although very large, are practically restricted to supplying the excess of legitimate demand beyond what American works, well located and well-managed, have the capacity of producing. This adjustment of prices—so that too much iron shall not be imported and too much American capital shall not be invested in furnaces and mills—is a very nice one, and has been brought about only by years of experience.

The present healthy condition of the iron trade appears to rest largely on the preservation of this equilibrium, and we judge that it will be held for some time to come.

Foundry pig-irons are still scarce and in active demand. We note a sale of 1000 tons No. 2 from a Pennsylvania furnace, and several smaller sales in this market of Southern irons.

There has been more inquiry for Bessemer pig, with quotations for foreign slightly advanced in view of actual business and with high freights.

The sales of steel rails amount to about 25,000 tons, and there are several considerable orders on the market which may be closed soon.

Steel billets are in good demand, with general sales reported at about our quotations.

Steel wire rods have advanced in response to active demand and high freights.

Old rails are even firmer, with buyers and sellers about half a dollar apart. There are rumors of a sale of a considerable lot of Tees at $24, but quotations are nominal.

The following quotations are of the ruling prices:

American Pig-Iron.—No. 1 X, $20.50@$22; No. 2 X, $19.50@$20.50; Forge, $17.50@$18.50.

Scotch Pig.—Coltness, $22.50@$23; Clyde and Dalmellington, $20.50@$21; Summerlee, $21.75@$22; Gartsherrie, $21; Shotts, $21.75@$22.

Cables to the Metal Exchange to-day quote Warrants, 41s. 11d. For special brands no quotation were received to-day, and we repeat last week's quotations, viz.: Coltness, 54s. 9d.; Langloan, 50s. 6d.; Summerlee, 52s. 6d.; Gartsherrie, 49s. 6d.; Glengarnoc, 49s.; Dalmellington, 44s. 3d.; Eglinton, 43s. 6d.

Bessemer Pig.—Foreign, $20@21; Domestic, about $19.50 at furnace.

Spiegeleisen.—Foreign 20 per cent, $27@$27.50; 30 per cent, $32; Ferro, $60.

Steel Blooms.—$29@$29.50.

Steel Billets.—$30.50@$31.00.

Steel Nail Slabs.—$30.50@$31.00.

Steel Wire Rods.—$40@$42 for shipment.

Steel Rails.—Heavy sections, nominally $38@$39 at mill. Light sections, $41@$44 at mill. Foreign Rails are quoted $40 at New Orleans.

Structural Iron and Steel.—At mill: Bridge Plate, 2·2@2¼c.; Angles, 2·25@2·3c.; Tees, 2·7@2·8c., Steel Angles, 2·6@2·75c. From dock, Beams and Channels, 3·3c., base.

Steel Plates.—On wharf: Tank and Ship, 2·85@3c.; Boiler Shell, 3@3¼c.; Boiler Flange, 3½@3¾c.; Boiler Fire-Box, 4@4½c.

Merchant Steel.—American Tool Steel, 7½@10c.; special grades 10@20c.; Crucible Machinery Steel, 4½@6c.; Bessemer Machinery and Spring, 2·7@3c.; Bessemer Cutlery, 3·2c.

Plate Iron.—Common Tank, 2·4@2·5c.; Refined, 2·5@2·6c.; Boiler Shell, 2·7@2·8c.; Boiler Flange, 3·7@3·8c.; Extra Flange, 4¼@4½c.

Bar Iron.—For Refined, 2@2·1c., base at wharf; Common, 1·9@2c., base at wharf.

Cast-Iron Pipe.—$34@$40, according to size.

Rail Fastenings.—Spikes, 2·4@2·6c., delivered; Angle Fish-Bars, 2·2@2·25c; Bolts and Square Nuts, 3·1@3·2c.; Bolts and Hexagonal Nuts, 3·3@3·4c.

Wrought Scrap Iron.—Foreign, ex ship, $20@$21, No. 1 yard scrap, $22@$23

Cast Scrap Iron.—$17@$17.50.

Old Car Wheels.—$18@$19.

Old Rails.—Tees, $23.50@$24.50; Double-Heads, $24@$25.

Nails—$2.05@$2.15 in car-load lots.

Louisville. July 13.

[Reported by GEORGE H. HULL & Co.]

The market for pig iron continues to exhibit more favorable features, and although no advance can be reported, at the same time some sales of some grades have been booked at higher figures. The advance in bar iron and nails is having its effect on the market for pig-iron, and is one of the factors that is stiffening the market. The demand from the interior is better than from the city, but some sales have been booked from the city proper at our outside quotations, for certain grades.

We quote for cash in round lots as below, quotations as far as possible being made from actual transactions:

PIG-IRON.

Southern Coke, No. 1 Foundry	$19.50@$21.00
" " No. 2 "	18 50@ 19 25
" " No. 2½ "	18.00@ 18 75
Hanging Rock Coke, No. 1 Foundry	19.00@ 20.00
" " Charcoal, No. 1 Foundry	
Southern Charcoal, No. 1 Foundry	21 00@ 22.00
Silver Gray, different grades	17.00@ 18.00
Southern Coke, No. 1 Mill, Neutral	17 50@ 18.25
" " No. 2 "	17.00@ 17.75
" " No. 1 Mill, Cold Short	17.00@ 17.50
" Charcoal, No. 1 Mill	18.50@ 19 50
White and Mottled, different grades	16 00@ 17 00
Southern Car-Wheel, Standard Brands	25 00@ 26.00
" " Other "	22.00@ 24.00
Hanging Rock, Cold-Blast	25.00@ 26 00
" " Warm-Blast	22.00@ 23 00

Philadelphia. July 15.

[From our Special Correspondent.]

The iron trade is opening up better all around. Prices are stronger, and some heavy transactions will be recorded before the middle of next week. The improving demand for rolled iron is beginning to be reflected in pig-iron. Holders of good brands are selling at outside quoted rates and makers are booking orders for future delivery at full rates. Yet buyers who have a large amount of business secured and very little crude iron contracted for, have not bought as much as they need, though next week or week after, if things keep right, will drain them out for large supplies. The furnace companies are pleased with the general undertone of the market, and makers of forge particularly look for an advance on standard makes to $18. Some little

business has been done in foreign material. There are offers for Bessemer billets and slabs, but no sales of importance. Three lots of muck bars were ordered yesterday. All users of merchant iron appear to have suddenly discovered that they were out of iron. Mills in city and in the interior began to take orders last week, and all are doing a good daily business, most of it at the lowest price, which accounts for the activity, as many expect an advance from $2 to $3 per ton when the fall trade opens up full. Car building is calling for large amounts. The plate mills have begun to fill up, and prices are fully $2 per ton stronger than the lowest June quotations. Locomotive builders and machine shop orders are more numerous and larger. Skelp iron orders foot up 2500 tons; plate, 1800 tons. Wrought iron pipe is active and mills are filling up. Merchant steel mill orders are good though not large. Structural iron business is heavy in Western and Eastern mills, and the only change is in the difficulty of early deliveries. The contracts entered and to be entered this month will give the structural iron makers full work far into October. Steel rail orders are few in number. Prices are very strong, and brokers are unable to place business satisfactorily. Old rails are scarce and dear. Store lots are trifling. Orders have gone abroad and deliveries will be made at $23@$23.50.

Scrap is more active and the general outlook is more encouraging.

	$	$
Foundry No. 1	20.50@21.50	
Foundry No. 2	18.50@20 00	
Gray Forge	18.00@18.50	
Bessemer Pig	20.50@21.00	
Foreign material:		
Steel Rail Bl'ms	30.00@30.50	
Foreign Bess'r	20.50@.....	
Spiegeleisen	27.50@.....	
Scrap, Selected	23.50@.....	
No. 1	23 00@.....	
Cargo Scrap	22.00@.....	
Muck-Bars		32.50@33.00
Merchant Iron		2@2.20c
Plate Iron		2.30@ 2.40
Tank Iron		2.30@ 2.40
Skelp Iron		2.15@.....
Structural iron:		
Angles		2.30@....
B'ms and Chan.		3 30@.....
Nails		2.10@ 2.25
Steel Rails		39.00@41.00
Old Rails		22.00@22 50

Pittsburg July 14.

[From our Special Correspondent.]

We regret to say the coke question has not yet been settled, although a different result was expected before this time. The patience of the coke syndicate is about exhausted, having hundreds of thousands of dollars tied up merely to please a set of men who refuse to work themselves, or let any other person do so. We expect to see this question settled in the near future. If a few hundred men, a large portion not being Americans, can set the law at defiance and dictate to American citizens who are desirous of conducting a legitimate busines, tell them when they shall work, how much they shall pay, and who they shall employ, we want to know it. This thing has gone far enough, and the test will be made.

The latest reports from the coke regions are to the effect that new men are going to work at most of the coke-ovens. "The advertisements in the Pittsburg papers for men" are being answered, and the operators are sending new men to the works as fast as they arrive.

Pig-Iron.—We can report a steady demand and a fair business being transacted. Prices are fully maintained, with a slightly upward tendency, particularly for city furnaces and standard brands. Occasionally we hear of a sale of "storage" or "unknown" below current rates. The stock in first hand is not large, still can obtain about all you want provided the terms are suitable. The price of coke to furnace men has not yet been adjusted; there are other matters for settlement which precede this. Old rails are firm, sales being confined to European lots principally. Muck bar steady. Blooms and billets hold their own. Taken as a whole the outlook is favorable.

Coke or bituminous:	$	$
Foundry No 1	20.50@21 00	
Foundry No. 2	20.00@20.25	
Gray F., No. 3	18.50@18.75	
" " No. 4	18.00@18.25	
White	17.00@17.50	
Mottled	17.00@17.75	
Silvery	19 00@19.25	
Bessemer	21.00@21.50	
Charcoal:		
Foundry No. 1	24.50@25.00	
Foundry No. 2	23.00@24.00	
Cold-Blast	26.00@29.00	
Warm-Blast	24.00@25.00	
20 p. c. Spiegel	31.00@32.00	
Muck-Bar	31.00@31.50	
Steel Blooms		32.00@32.50
Steel Slabs		31 00@32.00
Steel Crop Ends		21.50@22.00
St'l Bl'm Ends		21.00@21.50
Steel Billets		32.00@32.50
Old Iron Rails		26.00@27.00
Old Steel Rails		23.50@24.50
No. 1 W. Scrap		21.00@21.50
No. 2 W. Scrap		20.00@.....
Steel Rails		40.00@40 50
" light sect's		40.00@44.00
Bar Iron		2 00@nom.

Nails $2 net car lots.
Steel Nails $2 net car lots.
Two per cent off for cash.

SALES SINCE OUR LAST REPORT.

Coke and Coal Smelted Lake Ore.

1000 Tons Bessemer, delivered.....$21 50 cash
500 Tons Bessemer, delivered..... 22.00 cash.
500 Tons Good Neutral, delivered..... 18.50 cash.

Coke—Native Ore.

300 Tons Gray Forge..... 18.00 cash.
300 Tons No. 1 Foundry..... 20.00 cash.
375 Tons Gray Forge, storage..... 16 75 cash.
20 Tons No. 2 Foundry..... 20 50 cash.
30 Tons Silvery..... 19.50 4 mo.
40 Tons Silvery..... 18.50 cash.
40 Tons No. 2 Foundry..... 20.00 cash.
20 Tons Gray Forge, all ore..... 19 60 cash.
20 Tons Foundry..... 19.00 4 mo.

Charcoal.

425 Tons Cold B'ast..... 24.00 cash.
100 Tons No. 1 Foundry..... 25.50 cash.
20 Tons No. 2 Foundry..... 25.00 cash.
50 Tons Hot Blast, off grade..... 22.50 cash.

Steel Billets.

500 Tons Steel Billets..... 32.00 cash.
250 Tons Steel Billets..... 32.25 cash.

Muck Bar.

500 Tons Good Neutral, delivered..... 30.75 cash.

Steel Rail Ends.

300 Tons Rail Ends..... 21.75 cash.

FINANCIAL.

NEW YORK, Friday Evening, July 15.

The Condition of Business.

The favorable conditions of general trade reported one week ago continue in full force, and as then noted are more prominent in Illinois, Minnesota, Iowa, Missouri, Kansas and Louisiana than elsewhere. Larger cities in those States announce that orders for general merchandise for Autumn delivery are being received which in many instances exceed expectations. Commercial travelers are doing well, and except in staple dry goods and millinery and hardware, these reports apply almost uniformly to all jobbing lines. The interior request for hardware and for dry goods in Iowa and Missouri is less active than a week ago, but is of good proportions. The features referred to tend to stimulate anticipations of a good Fall trade. No gains are reported in commercial lines at the larger Eastern cities, unless an exception be made in favor of some varieties of cotton goods at Boston, for which the demand has increased both at home and abroad

The general financial situation in domestic markets has materially improved. The arrival at New York of over $3,000,000 in gold within ten days, together with treasury disbursements, has greatly relieved the pressure of the New York banks, and funds, both on call and on time, are loaning again at 4@4½ per cent and 5@6 per cent respectively. The large increase in the surplus reserve of New York banks, announced last Saturday, had much to do with allaying undue anxiety as to the loan market in the near future. There is also less stringency at Chicago and Kansas City, two important interior money centres, but at Boston funds are close. It may be as well, however, to recall the fact, that western banks are holding proportionately a much larger share of the total bank deposits and loans than one year ago, and that their gain is substantially the loss of the New York city banks, with which western financial institutions are carrying much smaller balances than formerly. For this, among other reasons, one may not look for as heavy surplus bank reserves at New York as have been reported in the past.

There is not much change in the industrial situation, taken as a whole. The glass-workers are on a vacation trying to arrange a new basis for wages, and the coke strike in the Connellsville regions has not been settled, although the oven owners are making violent exertions to that end. The more serious (in its effects) of recent strikes is that at the great Cohoes cotton mills.

The record of strikes among workers in iron and steel during the first half of 1887 shows, according to the record kept by *Bradstreet's*, that this class of industrial employés have engaged in more conflicts of this variety with employers than any other, while only about one half as many of them struck between January 1st and July 1st, 1887, as in a like portion of 1886. It is shown that there were 105 strikes of iron and steel employés in the past six months against 24 in the first half of 1886. A rough classification gives 14,547 strikers among iron and steel workers, 2080 machine shop employés, and 10,259 molders to July 1st, 1887, as compared with 22,975 striking iron and steel workers (4000 of them nailers), and 32,100 machine shop employés, from January 1st to July 1st in 1886

The strikes among coal miners this year include 18,325, against 28,500 a year ago. These totals do not cover the 13,000 coke strikes of 1887, but account for the widely extended bituminous coal strikes early last year. The increased number of individual strikes point to the intensity of the struggle between employers and employés in some lines, but the fewer numbers involved seem to indicate a growing discretion on the part of the laborer and the artisan in making use of the strike. The success of the Amalgamated Association of Iron and Steel Workers (one of the more conservative and better organized of the trades unions), in dealing annually with the Western Iron Manufacturers' Association, when arranging the scale of wages, appear to warrant the conclusion deduced from the valuable statistics reproduced above. When one comes to examine the meaning of the "sliding scale," as in practice in the associated western iron industries, he is impressed with what appears to be a recognition in it of a species of profit-sharing. The week shows no special gain in mercantile failures. *Bradstreet's* reports the total this year to date at 5389 for the United States against 5777 in a like portion of 1886, 6807 in 1885, 5972 in 1884 and as compared with 5515 in 1883.

Coal Stocks.

Interest at the New York Stock Exchange this week has centered about Mr. Gould and his supposed relation to the Ives-Staynor attempt to buy the Baltimore & Ohio Railroad and telegraph. Current opinion tends to the belief that Mr. Gould will squeeze Mr. Ives hard in order to compel Mr. Garrett to deal personally with him, Gould—for the latter does not generally fire large shot at small game, such as Ives. The possibility of "developments" has kept the street dull, for the "public" do not court two 24ths of June within thirty days.

There has been but little of an exciting nature in the dealings in the coal stocks this week. Prices were generally quite well maintained, with an advance in the last two days.

Colorado Coal has varied between the limits 43 and 44¾, the higher price being obtained to-day.

Columbus & Hocking Coal went off from 38@35½ under sales of 1800 shares.

The anthracite roads have remained almost stationary under moderate sales, the favorable outlook of the coal trade balancing the depressing influence of the extremely warm weather, which drove many of the operators out to sea or to the mountains. New York & Perry Coal opened the week at 69¾@69½, and suddenly on the 13th jumped down to 49 and 50, to-day closing at 50¼@50½, and yet the sales aggregate only 800 shares. The Reading was by far the most active stock on the list, recording sales here and in Philadelphia of 264.017; the prices varied between the extreme limits of 54 and 56¾.

The transactions in the other stocks offered no feature worthy of note.

The Indiana Block Coal Railroad Company gives notice that in accordance with the terms of the mortgage securing the same Bond No. 16 for $1000 issued by the Indiana Block Coal Company has been drawn for the sinking fund. The bond will be paid on presentation at the office of the Farmers' Loan and Trust Company in New York. Interest thereon will cease on August 10th, 1887.

The receivers of the Philadelphia & Reading Railroad Company will purchase, on and after July 11th, 1887, interest and coupons of the following divisional coal land mortgage bonds of the Philadelphia & Reading Coal and Iron Company, guaranteed by the Philadelphia & Reading Railroad Company: Brady, Gray & Wetherill 6 per cent, Mt. Carmel, Locust Mountain Coal Company 6 per cent, St. Clair 5 per cent, Locust Mountain Summit Improvement Company 5 per cent, Catherine Groh 5 per cent, Tamabua 4 per cent, Minersville 4 per cent, Diamond 4 per cent, Coal Hill 4 per cent, Kunkel & Branham 4 per cent, and Valley Furnace 4 per cent.

Mining Stocks.

The week shows a considerable improvement both in respect to volume of business transacted and in the prices of various stocks. This has been brought about by further favorable reports from California, where it is said that the boom has "come to stay." If prices have not made remarkable headway, the gains are at least maintained, and so long as this continues to be the case the New York market is likely to sympathize accordingly. On Wednesday last much interest was shown in the course of the market, and prices commenced to harden. The interest in mining stocks is larger than for some time past, and it is evident that a good forward movement will be welcome. It is yet too early to express an opinion in respect to the probable permanence of the present upward movement, and the coming week will probably determine its true value.

The sudden death to-day of Vice-President Hill, of the Stock Exchange, brought business to a close there at noon, and the effect was felt at the Consolidated Stock and Petroleum Exchange, where little business was done in the afternoon.

Phœnix of Arkansas, regarding which we have frequently referred in terms not very encouraging to the stockholders, wags along at lower prices than before. The loss in price since the stock first made its appearance in the Board is any thing but a healthy indication. This week's prices show a decline from $2.15 to $1.90, at which figure it was selling to-day; but what can be expected of a property which is undeveloped, and concerning the value of which no expert testimony is offered.

El Cristo has at times shown signs of awakening and making some headway in price. Some remarkably favorable reports have been given out for publication regarding the condition of affairs at the mine when Superintendent Skyrme turned the property over to Engineer Carleton. On several occasions during the week there were little spurts in the stock, which, after all the fuming, indicated little or nothing. An actual substantial advance would be received with greater favor by the stockholders than fresh prophecies, which have heretofore proved illusive. The lowest figure reached this week was $4.90, and the highest $5.63, at which price the stock was selling to-day.

Very little has been doing in Santiago, which is now being dealt into a very small extent. The owners persist in giving out most favorable reports of the prospects at the mine, and it must be said that these are generally credited. At the same time the decreased demand and low level reached for the shares is not a healthy sign. We record a further decline in the price, which opened at $3 40, and during the week advanced to $3.50, declining to-day to $3.15.

The market for Security presents no important or interesting features since our last review. The stock changes hands to the extent of a few thousand shares. The price declined from $6.37 to $5, selling to-day from $5.25 to $6. Total nominal transactions for the week amounted to 23,400 shares. Inasmuch as the recent junketers to the mine pretend to have gazed upon mountains of wealth in the mine, it appears to us that now would be the time to ship a few specimen bricks to the East for the inspection of the doubting Thomases.

The stock of the Tornado Gold and Silver Mining Company, of Nevada, which appeared on the list last week, continues steady, with a good demand, and shows the second largest business on the list. The price opened at 92c., and has since advanced to 99c.

Another "boom struck Sutro tunnel on Wednesday, when the price advanced from 37c. to 41c. A large number of shares have since changed hands at from 38c. to 43c. The total transactions of the stock amounted to 140,630 shares. A stronger movement has also been shown in Consolidated

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par	Assessments. Total levied.	Assessments. Date and amount of last			Dividends. Total paid	Dividends. Date and amount of last		
1	Adams, S. L	Colo.	$1,500,000	150,000	$10	*				$555,000	Jan	1887	.10
2	Alice, S C	Mont	10,000,000	40,000	25	*				750,000	Sept	1886	06¼
3	Alturas, G	Idah.	1,500,000	3 0,000	5					95,0 0	Sept	1886	.50
4	Amie Con., S. L	Colo.	5,000,000	500,000	10	*				330,000	Oct	1883	.05
5	Amy & Silversmith, S.	Mon.		$11,419						204,852	Dec	1886	.10
6	Atlantic, C	Mich	1,000,000	40,000	25	$230,000	Apl.	1875	$1.00	360,000	Jan.	1887	$1.00
7	Argenta, S	Nev..	10,000,000	100,000	100	295,000	July	1885	.10	40,000	Feb.	1880	.20
8	Aurora, I	Mich.	1,000,000	40,000	25					40,000	Apl.	1887	1.00
9	Barbee & Walker, S.	Utah	1,000,000	100,000	10	*				60,000	Nov	1880	.10
10	Bassick, G. S	Colo.	10,000,000	100,000	100	*				400,000	Mar.	1884	1.00
11	Belle Isle, S	Nev..	10,000,000	100,000	100	160,000	Feb	1887	.20	300,000	Dec.	1879	.25
12	Belcher, G. S	Nev..	10,400,000	104,000	100	2,217,335	ec.	1885	.30	15,397,000	Apl	1876	1.00
13	Bellevue Idaho, S. L	Idah.	1,250,000	125,000	10	26,250	Dec.	1883	10	200,000	Jan	1887	.10
14	Big B'nd Hydraulic, G	Dak..	1,000,000	200,000	5	*				252,000	July	1887	.03
15	Black Bear, G	Cal..	3,000,000	30,000	100	22,500	Dec.	1884	.25	895,000	May	1883	.20
16	Bodie Con., G. S	Cal..	10,000,000	100,000	100	374,990	Jan.	1887	.50	1,602,572	Apl.	1885	.50
17	Bonanza Developm't	C&M	3,000,000	300,000	10					135,000	Oct.	1882	.15
18	Bonanza K'g, Cons.	Cal..	1,000,000	100,000	10	*				185,000	Feb.	1885	.10
19	Boston & Mont, G	Mont	2,500,000	250,000	10	*				520,000	Jun	1886	.15
20	Breece, S	Colo.	5,000,000	200,000	25	*				2,000	Feb	1880	.01
21	Brooklyn Lead, L. S	Utah	500,000	50,000	10					127,000	July	1887	.05
22	Bulwer, G	Cal	10,000,000	100,000	10	60,000	July	1887	.20	175,000	Jan.	1884	.10
23	Caledonia, G	Dak	10,000,000	100,000	100	505,000	May	1885	.15	40,000	Feb.	1886	.10
24	Calumet & Hecla, C	Mich	2,500,000	100,000	25	1,200,000				28,850,000	Mar.	1887	5.00
25	Carbonate Hill, S. L	Colo.	2,000,000	200,000	10	*				80,000	Apl.	1884	.05
26	Caribou Con., S	Colo.	1,500,000	150,000	10	*				50,000	Mch	1880	.10
27	Castle Creek, G	Idah.	100,000	100,000	1					51,000	Oct.	1883	.03
28	Catalpa, S. L	Colo.	3,000,000	300,000	10	*				270,000	May.	1884	.10
29	Central, C	Mich	500,000	20,000	25	100,000	Sept	1861	.06	1,820,000	Feb	1887	2.00
30	Christy, S	Utah	10,000,000	100,000	100					10,000	Jun.	1885	.10
31	Chrysolite, S. L	Colo.	10,000,000	200,000	50	*				1,650,000	Dec.	1884	.25
32	Colorado Central, S. L	Colo.	2,750,000	275,000	10	*				213,875	Aug.	1887	.05
33	Cons. Cal. & Va., G. S.	Nev..	21,600,000	216,000	100	108,000	Jan.	1885	.20	820,000	July	1887	.50
34	Con. Gold Mining, G.	Ga..	500,00	100,000	5	*				108,000	Nov.	1883	02
35	Contention, S	Ariz.	12,500,000	250,0 0	50					2,587,000	Dec.	1884	.25
36	Crescent, S. L. G.	Utah	15,000,000	600,000	25	*				210,000	Aug.	1886	.05
37	Crown Point, G. S	Nev.	10,000,000	100,000	100	2,675,000	Feb.	1882	.25	11,588,000	Jan.	1875	2.00
38	Daly, S. L	Utah		150,000						150,000	May	1887	.25
39	Deadwood-Terra, G	Dak..	5,000,000	200, 00	25	*				920,000	July	1887	.10
40	Derbec B. Grav., G. S.	Cal..	10,000,000	10 ,000	100	90,000	Dec.	1881	.10	180,000	May	1887	.10
41	Dunkin, S. L	Colo.	5,000,000	200 000	25	*				220,000	Sept	1884	.05
42	Elkhorn, G. S	Mont	1,000,000	100,000	10	50,000	July	1883	.50	175,000	May	1887	.05
43	Eureka Con., G. S. L	Nev.	5,000,000	50,000	100	500,000	July	1886	1.00	4,817,500	July	1882	.25
44	Evening Star, S. L	Colo	500,000	50,000	10	*				1,400,000	Nov	1883	.50
45	Excelsior, G	Cal..	10,000,000	100,000	100	560,000	Sept	1885	1.00	875,000	Oct.	1886	.25
46	Father de Smet, G	Dak..	10,000,000	100,000	100	200,000	Nov	1878	1.00	1,125,000	Dec.	1885	.20
47	Franklin, C	Mich	1,000,000	40,000	25	220,000	Jun	1871		560,000	Dec	1886	1.00
48	Freeland, G. S. C	Colo	5,000,000	200,000	25	*				190,000	July	1886	.10
49	Fresno Enterprise, G	Cal..	5,000,000	100,000	50			Mch	1883	.10	110,000	July	1882	.10
50	Garfield Lt., G. S	Nev	500,000	100,000	5						25,000	Mar.	1885	12½
51	Gould & Curry, G. S.	Nev	10,800,000	108,000	100	4,159,400	Jun	1887	.50	3,826,000	Oct.	1870	10.00
52	Grand Central, S	Ariz.	1,000,000	100,000	10					625,000	Dec.	1882	.25
53	Grand Prize, S	Nev.	10,000,000	100,000	100	570, 0	Apl.	1886	.50	495,000	Mar.	1884	.25
54	Granite, S	Colo.	125,000	25,000	1					6,250	May	1883	.01
55	Granite Mountain, S.	Mont	10,000,000	400,000	25					2,600,000	July	1887	.25
56	Green Mountain, G	Cal..	1,250,000	125,000	10	*				212,000	Nov.	1881	.07½
57	Hale & Norcross, G. S	Nev..	11,200,000	112,000	100	5,086,800	July	1887	.50	1,598,000	Apl	1871	5.00
58	Hall-Anderson, G	N. S..	150,000	150,000	1					7,000	Jan.	1882	.05
59	Hecla Con., S. G. L. C	Mont	1,500,000	30,000	50					1,047,000	Aug	1886	.50
60	Hel'a Mg & Red, G. S. L	Mon	3,315,000	663,000	5	*				197,97	July	1886	.06
61	Holmes, S	Nev.	10,000,000	100,000	100	300,000	Sept	1885	10	75,000	Apl.	1886	.25
62	Holyoke, G	Idah.	200,000	200,000	1					27,000	Feb.	1883	.10
63	Homestake, G	Dak	12,500,000	125,000	100	200,000	July	1878	1.00	3,843,750	Jun.	1887	.20
64	Honorine, S. L	Utah	5 0,000	250,000	2	25,000	Jun.	1883		100,000	Apl.	1887	.05
65	Hope, S	Mont	400,000	8,000	50	*				158,252	Oct.	1884	1.50
66	Horn-Silver, S. L	Utah	10,000,00	400,000	25	*				4,000,000	Nov.	1884	.50
67	Idaho, G	Cal..	310,000	3,100	100					4,539,500	Apl.	1887	5.00
68	Ideal, S L	Colorado	1,500,000	150,000	10					15,000	Oct.	1886	.05
69	Illinois, S	N M.	100,000	100,000	1	*				25,000	Jan	1887	.25
70	Independence, S	Nev..	10,000,000	100,000	100	340,000	Oct.	1886	.20	225,000	Sept	1879	.25
71	Indian Queen, S	Nev..	250,000	25,000	2					368,750	July	1883	.03
72	Invo, G	Cal..	500,000	100,000	5	*				45,000	Apl.	1882	.05
73	Iron Hill, S	Dak.	2,500,000	250,000	10	82,500	Oct.	1885		112,500	Oct.	1886	.05
74	Iron-Silver, S. L	Colo	10,000,000	500,000	20	*				2,000,000	Jun.	1887	.20
75	Jackson, G. S	Nev	5,000,000	50,000	100	10,000	Nov.	1880	.20	45,000	Oct.	1885	.10
76	Jocuistita, S	Mex.	2,500,000	250,000	10					1,20 ,000	Feb.	1885	.50
77	Jumbo, G	Colo.	2,000,000	200,000	10					15 000	Jun.	1887	.02½
78	Kentuck	Nev	3,000, 00	30,000	100	342,000	Nov	1881	.30	1,600,000	Dec.	1886	.10
79	La Plata, S. L	Colo.	2,000,000	200,000	10	*				610,000	Sept	1882	.30
80	Leadville Cons., S. L. I.	Colo	4,000,000	400,000	10	*				433,000	Apl	1887	.05
81	Lexington, G. S	Mont	4,000,000	40,000	100	*				565,000	Jan	1885	2.00
82	Little Chief, S. L	Colo	10,000,00	200,000	50	*				780,000	Mch	1885	.10
83	Little Pittsburg, S. L	Colo.	20,000,000	200,000	100	*				1,050,000	Mch.	1880	.50
84	Manhattan, S	Nev	5,000,000	50,000	100	300,000	Jun	1887	1.00	437,500	Feb	1886	.25
85	Marguerite, G	Cal..	500, 00	25,000	20					18,750	Oct.	1882	.25
86	Marion Bullion, G	N C	500,000							15,000	Jan.	1886	
87	Martin White, S	Nev.	10,000,00	100,000	100	1,150,000	Mar.	1886	.25	140,000	Dec.	1886	.25
88	Mary Murphy, G. S	Colo.	350,000	3,500	100	*				70,000	Apl.	1887	5.00
89	Minnesota, C	Mich	1,000,00	40,0 0	25	420,000	Apl.	1886	1 00	1,820,000	Mar.	1876	
90	Mono, G	Colo.	5,000,0 0	5 ,000	100	585,000	Mar	1887	.50	12,500	Mar	1857	.05
91	Montana, Lt, G. S	Mont	3,300,0 0	330,000	10	*				1,247,400	July	1887	.75
92	Morning Star, S. L	Colo.	1,000,0 0	100,000	10					675,000	Dec.	1886	.25
93	Moulton, S. G	Mont	2,000,000	400,000	5	*				35,000	May	1887	.07½
94	Mount Pleasant, G	Cal.	150,000	150,000	1	*				150,000	Feb.	1887	.30
95	Mt. Diablo, S	Nev	5,000,000	50,000	100	137,500	Jun.	1880	2.00	80,000	July	1885	.20
96	Napa, Q	Cal..	700,000	100,000	7					290,000	Jan.	1883	.10
97	Navajo, G. S	Nev..	10,000,000	100,000	100	450,000	Mar.	1887	30	325,000	Feb.	1885	.25
98	N. Hoover Hill, G. S.	N. C.	300,000	120,000	2½	*				30,000	Dec.	1885	.06½
99	New York Hill, G	Cal..	5,000,000	50,000	100	62,500	Oct	1885	.15	215,000	Aug.	1882	.10
100	Northern Belle, S	Nev..	5,0 0,000	50,000	100	425,000	Jan.	1884	8.00	2,400,000	Apl.	1883	50
101	North Belle Isle, S	Nev..	10,000,000	100,000	100	250,000	Mar	1887	.50	3 ,000	Aug.	1881	.15
102	Ontario, S. L	Utah	15,000,000	150,000	100					8,375,000	Jun.	1887	.50
103	Ophir, G. S	Nev..	10,000,000	100,000	100	4,007,800	Dec.	1886	.50	1,595,000	July	1882	1.00
104	Original, S. C	Mont	1,500,000	60,000	25	*				123,000	Jun.	1887	.05
105	Osceola, C	Mich	1,250,000	50,000	25	480,000	Apl.	1876	1.60	1,022,500	Jan.	1887	1 00
106	Oxford, G	N. S.	125,000	125,000	1	*				34,500	Oct.	1887	.02
107	Paradise Valley, G. S	Nev	10,000,000	100,000	100	47,000	Mar.	1882	.15	150,000	Apl	1887	.10
108	Parrott, C	Mont	1,800,000	180,000	10					18,000	May	1887	.10
109	Peacock, S. G. C	N. M.	2,000,000	200,000	10	*				60,000	Nov.	1886	
110	Pleasant Valley, G. S.	Cal..	10,000,000	100,000	100	10,000	Mar.	1884	.10	30,000	Dec.	1882	.05
111	Plutus, G. S. C. L	Colo.	2,000,000	200,000	10	*				20,000	Feb.	1886	.10
112	Plymouth Con., G	Cal..	5,000,000	100,000	50	*				2,040,000	Aug.	1887	.40
113	Prussian, S. L	Colo	1,500,000	150,000	10					132,000	Jan	1884	.10
114	Quicksilver, pref., Q	Cal..	4,300,000	43,000	100					914,150	Aug.	1887	1.50
115	" com., Q	Cal	5,700,000	57,000	100					151,000	July	1887	.40
116	Quincy, C	Mich	1,000,000	40,000	25	200,000	Dec.	1862		4,570,000	Jan	1887	4.00
117	Richmond, S. L	Nev..	1,350,000	54,000	25	*				4,312,587	Jun.	1887	1. 25
118	Ridge, C	Mich.	5 0,000	20,000	25	220,000	Mar	1886	.50	10 ,000	Feb.	1880	.50
119	Rising Sun, S	Dak..	750,000	150,000	5	*				52,000	May	1881	.07½
120	Robinson Con., S. L	Colo.	10,000,000	200,000	50	*				585,000	Mar.	1886	.05
121	Robert E. Lee, S. L	Colo	10,000,000	500,000	20					100,000	Dec.	1882	.10
122	Rooks, G	Vt	500,000	50,000	10	*				61,000	Apr	1885	.30
123	San Francisco, C	Cal..	5,000,000	50,000	100	45,000	Sept	1880	.50	20,000	Feb.	1884	.05
124	Savage, S	Nev..	11,200,000	112,000	100	6,268,000	July	1887	50	4,460,000	July	1869	3.00
125	Security L. Mg., Mfg.	Colo.	1,000,000	100,000	10	*				50,000	July	1884	
126	Shoshone, G	Idah.	150,000	150,000	1					7,500	Apl.	1883	.01
127	Sierra Buttes, G	Cal..	225.000	22,500	10					1,438,964	ct.	1886	.37
128	Sierra Grande, S	N. M.	2,500,000	500,000	5					860,000	Sept	1884	.25
129	Sierra Nevada, G. S.	Nev..	10,000,000	100,000	100	6,257,000	Apl.	1887	.50	102,000	Jan.	1871	1.00
130	Silver Cord, G. S. L	Colo.	5,000,00	500,000	10					225,000	Nov.	1883	.25
131	Silver King, S	Ariz.	10,000, 0	100,000	100					2,000,000	July	1887	.25
132	Silverton, G. S. L	Colo.	2,000,000	200,000	10	*				70,000	Nov.	1886	.02
133	Small Hopes Cons., S	Colo.	5,000,000	250,000	20	*				2,812,500	Jun.	1887	.20
134	Smuggler, S. L	Colo.	600,000	60,000	10					66,700	Aug.	1883	.25
135	Socorro, C	N. M.	250,000	4,500	100					4,000	Mch	1882	.00¼
136	South Yuba, G	Cal..	2,000,000	0 0 0	50	*				150,000	Oct.	1881	.75
137	Spring Valley, G	Cal..	2,00,000	2 0 000	1	50,000	Oct.	1886	.25	50, 0	Jan.	1881	.25
138	Standard, G. S	Cal..	10 000,0	1 0,000	100	25,000	Oct.	1884	.25	4,425,000	Mar.	1884	.25
139	Stormont, S	Utah	500,0	500,000	1	*				155,000	Nov.	1881	.05
140	St. Joseph, L	Mo..	1,5 0,0 0	150,000	10	*				784,000	Jun.	1887	.20
141	Syndicate, G	Cal..	10,000,000	100,000	100	38,729	July	1882	.15	48,308	Sept	1885	.10
142	Tip Top, S	Ariz	10,000,000	100,000	100	250,000	Sept	1883	.25	100,000	Nov.	1881	.20
143	Tombstone, G. S. L	Ariz	12,500,00	500,000	25	*				1,250,000	Apl.	1882	.10
144	True Fissure, G. S. L	Utah	1,500,00	150,000	10	*				75,000	Jun.	1883	.15
145	United Verde, C	Ariz.	3,000,000	300,000	10	*				97,500	Feb.	1884	.20
146	Valencia, M	N. H.	150,000	1,500	100	*				37,500	Apl	1886	2.50
147	Viola Lt., S. L	Idah.	750,000	150,0 0	5	*				74,500	May	1887	.12½
148	Vizina, S	Ariz.	5,000,000	200,000	25	*				140,000	Apl.	1882	.10
149	Yankee Girl	Colo	2,500,000	250,000	10					1,075,000	Jan	1887	.05
150	Yellow Jacket, G. S.	Nev..	12,000,000	120,000	100	5,448 00	Dec.	1885	.75	2,184,000	Aug.	1871	1.50

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par Value	Assessments. Total levied.	Assessments. Date & am'un of last.			
1	Agassiz Cons., S. L	Colo.	$2,500,000	50,000	$50	*				
2	Albion, S. L	Nev..	15,000,000	150,000	100	$577,000	July	1883	.50	
3	Allouez, C	Mich	2,000,000	80,000	25	240,000	Feb	1884	.50	
4	Alpha Con., G. S.	Nev..	3,000,000	30,000	100	44 ,000	Jan.	1887	.50	
5	Alta, S	Nev..	10,080,000	100,800	100	2,027,000	Feb	1887	50	
6	Amador, G	Cal..	400,000	200,000	2	*				
7	American Flag, S	Colo	1,250,000	125,000	10	300,000	Jun.	1877	.25	
8	Anglo-Montana, Lt.	Mon.	600,000	120,000	5					
9	Appalachian, Lt., G	N. C.	1,500,000	300,000	5					
10	Aspen Mg. & S., S. L	Colo.	2,000,000	200,000	10					
11	Barcelona, G	Nev..	5,000,000	200,000	25	*				
12	Bechtel Con., G	Cal..	10,000,000	100,000	100	173,500	Jan.	1883	.10	
13	Belmont, S	Nev..	5,000,000	50,000	100	735,000	Apl.	18 6	.10	
14	Best & Belcher, G. S.	Nev..	10,080,000	100,800	100	1,849,390	Jun.	1887	.50	
15	Big Pittsburg, S. L	Colo.	20,000,000	200,000	100	*				
16	Bi-Metallic, S	Mon.	5,000,000	200,000	25	*				
17	Black Jack, G	Cal..	250,000	100,000	2½					
18	Bondholder	Colo	500,000	200,000	2½					
19	Boston Con., G	Cal..	10,000,000	100,000	100	170,000	Nov	1883	.25	
20	Bradshaw, S	Ariz.	2,250,000	225,000	10					
21	Brunswick, G	Cal..	2,000 000	400,000	5	*				
22	Bullion, G. S	Nev..	10,000,000	100,000	100	5,000,000	Jan.	1887	.40	
23	Bve and Bye	Ariz.	1,000,000	100,000	10	*				
24	Calaveras, G	Cal..	500,000	500,000	1	*				
25	Carisa, G	Wy	500,000	100,000	5	*				
26	Cen Contin'l, G. S. L	C.&A	2,000,000	200,000	10	*				
27	Charles Dickens, G. S.	Idah.	1,250,000	250,000	5	*				
28	Cherokee, G	Cal..	1,500,000	150,000	10					
29	Cholla r, S	Nev..	11,200,0 0	112,000	100	1,096,000	Nov	1886	.50	
30	Cinnamon Mt., G. S.	Colo	750,000	150,000	5					
31	Climax, S. L	Colo.	2,000,000	200,000	10	*				
32	Colorado No. 2, S. L	Colo.	100,000	10,000	10	*				
33	Comstock, G. S	Nev..	10,000,000	100,000	100	30,000	Mar.	1887	.15	
34	Con. Imperial, G. S.	Nev..	50,000,000	500,000	100	1,100,000	Aug.	1886	10	
35	Con. Pacific, G	Cal..	6,000 000	60,000	100	174,000	Feb.	1886	.15	
36	Cons Silver, S	Mo...	2,500,000	250,000	10					
37	**Cop. Queen Cons, C.	Ariz	1,400 00	140,000	10					
38	Courtlandt	Colo	500,000	50,000	10					
39	Crescent, S. L	Colo.	3,000,000	300,000	10	*				
40	Crocker, S	Ariz.	10,000.000	100,000	100	75,000	May	1887	.10	
41	Crowell, G	N. C	500,000	500,000	1					
42	Dahlonega, G	Ga...	250,0 0	250,000	1	*				
43	Dandy, S	Colo.	5,000,000	500,000	10					
44	Dardanelles, G	Cal..	1,000,000	100,000	10					
45	Decatur, S	Colo.	1,500,000	300,000	5	*				
46	Denver City, S. L	Colo.	5,000,0 0	500,000	10	*				
47	Denver Gold	Colo.	300,000	80,000	5					
48	Deseret, G S	Utah	500,000	50,000	10	*				
49	Dunderberg, S	Colo.	1,500,000	150,000	10	*				
50	Durango, G	Colo.	500,000	500,000	1	*				
51	Eastern Dev. Co., Lt.	N. S.	1,500,000	150 000	10	990,000	Mar.	1886	1.60	
52	El Cristo, G. S	U.S.C	1,000,000	500,000	2					
53	El Dorado, G	Cal.	1,000,000	250,000	4	*				
54	Empire Lt., G	Mon.	5 0,000	100,000	5					
55	Empire, S	Utah	10,000,000	100,000	100	*				
56	Enterprise, S. L	Colo.	800,000	80,000	10	*				
57	Eureka Tunnel, S. L	Nev..	10,000,000	100,000	100	*				
58	Exchequer	Nev	10,000,00	100,000	100	880,000	July	1887	.20	
59	Gold Cup, S	Colo.	5 0,000	500,000	1	*				
60	Gold Placer, G	Colo.	5,000,000	200,000	25	229,314	Dec.	1885	.25	
61	Gold Rock, G	Cal.	1,000,000	500,000	2	*				
62	Goodsnaw, G	Cal..	10,000,000	100,000	100	*				
63	Grand Belt, C	Tex.	12,000,000	120,000	100					
64	Grand Duke	C lo.	800,000	80,000	10					
65	Great Romance, G	U S C	1,0 0,000	50,000	2	*				
66	Gregory-Bobtail, G	Colo.	550,000	550,000	1	*				
67	Gregory Con., G	Mon.	3,000,000	300,000	10					
68	Harlem M. & M. Co, G.	Cal..	1,000,00	200,000	5					
69	Head Cent. & Tr. & G	Ariz.	10,000,000	100,000	100					
70	Hector, G	Cal..	1,500,000	300,000	5					
71	Highland, C	Mich	500,000	25,000	25					
72	Hortense, S	Colo.	2,000,00	200,000	10					
73	Huron, C	Mich	1,0 0,000	40,000	25	280,000	May	1887		
74	Iron Gold & Silver, S	N. M.	2,000,000	200,000	10					
75	Iroquois, C	Mich	1,250,000	50, 00	25					
76	J. D. Reymert	Ariz	10,000,000	100,000	100	*				
77	Julia Cons., G. S	Nev..	11,000,000	110,000	100	1,452,000	Apl.	1887	.10	
78	Kearsarge, C	Mich	1 250,000	50,000	25	100,000	Apl.	1886	5.00	
79	Laclede	N. M.	2,000,000	200,000	10					
80	Lacrosse, G	Colo.	1 000 00	100,000	10	*				
81	Lee Basin, S L	Colo.	5,000,000	500,000	10	*				
82	Lucerne, S	Colo.	5,000,000	500,000	10	*	Jan.	1885	.10	
83	Mammoth Bar, G	Cal..	10,000,000	100,000	100	50,000	Dec.	1881		
84	Mariposa pref., G	Cal..	5,000,000	50,000	100	1,687,500	Feb	1885	.25	
85	" common, G	Cal..	10,000,000	100,000	100	1,975,000	Dec	1881	.20	
86	May Belle, G	Cal..	10,000,000	100,000	100	84,000	Mar.	1884	.15	
87	Mayflower Gravel	Cal..	1,0 0,000	100,000	10	185,000	Jun.	1887	.25	
88	Medora, G	Dak.	25 ,000	250,000	1					
89	Mexican, S	Nev..	10,000,000	100,000	100	2,815,960	July	1887	.25	
90	Middle Bar G	Cal.	400,000	200,000	2	*				
91	Mike & Starr, S	Colo.	1,000,000	200,000	5	*				
92	Moose Silver, S	Colo.	3,000,00	300,000	10	*				
93	Nachoochee, Lt., G	Ga..	1,000,000	200,000	5					
94	Neath, G	Colo.	1,0 0,00	10 ,000	10					
95	Nevada Queen, S	Nev.	10,000,000	100,000	100	80,000	Mar	1887	.50	
96	New Germany, G	N. S.	100,000	100,000	1	*				
97	New Pittsburg, S. L	Colo.	2,000,000	200,000	10	*				
98	North Standard, G	Cal..	10,000,000	100,000	100	20,000	Nov			
99	Noonday	Cal..	600,000	60,000	10	208,000	Dec.	1881	.10	
100	Oneida Chief, G	Cal	500,000	125,000	4	*				
101	Oriental	Nev..	2,000,000	200,000	10					
102	Oriental & Miller, S	Nev..	10,000,000	400,000	25					
103	Overman, G. S	Nev..	11,520,000	115,200	100	3,736,880	Jan.	1887	.30	
104	Park, S	Utah	2,000,000	200,000	10					
105	Peer, S	Ariz.	10,000,000	100,000	100	135,000	Nov.	1886	.10	
106	Peerless, S	Ariz.	10,000,000	100,000	100	295,000	Nov.	1886	.20	
107	Phenix	Ariz.	500,000	500,000	1					
108	Phoenix, G. S	Ariz.	5,000,000	200,000	25	*				
109	Phoenix Lead	Colo.	100,000	100,000	1	*				
110	Potosi	Nev..	11,250,00	112,000	100	1,145,600	Mar.	1887	.30	
111	Princeton	Colo.	1 0,000	100,000	1					
112	Puritan, S. G	Colo.	1,500,000	150,000	10	*				
113	Quin y	Colo.	3,000,000	300,000	10	*				
114	Rappahannock, G. S

NEW YORK MINING STOCK QUOTATIONS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	July 9.		July 11.		July 12.		July 13.		July 14.		July 15.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Alice, Mon	....	.....	1.20	....	.....	....	1.00	....	1.00	.....	....	.....	400
Argenta, Nev	.....	.....	.....	.....	.45	....	.....	.....	.....	.....	....	.....	200
Bassick, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Belcher, Nev	.....	.....	12.25	....	.....	.....	.....	.....	.....	.....	.....	.....	100
Belle Isle, Nev	.....	.....	.....	.....	1.35	....	.....	.....	1.10	.....	.....	.....	1,800
Bodie Cons., Cal	.....	.....	.....	.....	2.70	.....	.....	.....	2.90	.....	2.70	.....	340
Breece, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bulwer, Cal	....	.....	.90	.....	.90	.....	.....	.....	1.00	.95	.....	.....	2,700
Caledonia, Dak	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Challar, Nev	.....	.....	.....	.....	.....	.....	9.00	8.75	.....	.....	.....	.....	200
Chrysolite, Colo	....	.....	.....	.....	.....	.....	.52	.50	.....	.....	.....	.....	560
Colorado Cent'l, Colo	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cons. Cal. & Va., Nev	....	....	22.00	....	20.75	....	21.75	....	23.25	.....	22.25	....	560
Crown Point, Nev	.....	.....	.....	.....	.....	.....	18.00	16.50	.....	.....	.....	.....	200
Deadwood, Dak	2.85	.....	2.30	2.25	2.75	2.30	2.50	2.20	2.50	2.35	2.50	.....	2,250
Dunkin, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Eureka Cons., Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Father de Smet, Dak	.....	.....	.....	.....	.70	...	.60	.....	.60	.55	.....	.....	700
Freeland, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gold Stripe, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gould & Curry, Nev	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Green Mountain, Cal	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hale & Norcross, Nev	....	.....	.....	.....	6.00	5.50	.....	.....	.....	.....	5.87	....	400
Helena, Mont	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....
Holyoke, Idaho	.14	.....	.....	.....	.13	.12	.13	....	.12	....	.....	.....	5,700
Homestake, Dak	15.12	15.00	14.75	....	.....	.....	.....	.....	.....	.....	.....	.....	140
Horn-Silver, Ut	....	.....	.....	.....	.95	.....	1.00	.....	.....	.....	.....	.....	300
Independence, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Iron Hill, Dak	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Iron Silver, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Leadville C., Colo	....	....	....	....	.53	....	.53	....	.....	.....	.....	.....	200
Little Chief, Colo	.30	.....	.....	.....	.....	.....	.31	....	.....	.....	.....	.....	1,200
Little Pittsburg, Colo	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Martin White, Nev	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mono, Cal	.....	.....	.....	.....	....	.....	.....	.....	.....	.....	.....	.....	.....
Moulton, Mont	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Navajo, Nev	.....	.....	.....	.....	.....	.....	.....	.....	1.35	.....	.....	....	400
North Belle Isle, Nev	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ontario, Ut	.....	.....	.....	.....	26.00	.....	.....	.....	28.00	.....	.....	.....	70
Ophir, Nev	.....	.....	.....	.....	.....	.....	.....	.....	9.63	9.00	9.00	....	300
Plymouth, Cal	.....	.....	.....	.....	21.00	20.50	21.00	.....	21.75	.....	21.87	.....	595
Quicksilver Pref., Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
" Com., Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Robinson Cons., Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	100
Savage, Nev	.....	.....	6.87	.....	.....	.....	.....	.....	7.50	.....	7.00	....	440
Sierra Nevada, Nev	...	.....	.....	.....	4.70	.....	5.75	.....	.....	.....	.....	.....	200
Silver King, Ariz	.....	.....	.....	.....	8.00	.....	.....	.....	.....	.....	8.25	....	110
Standard, Cal	.....	.....	1.35	1.20	1.80	1.70	1.80	1.70	1.75	1.70	.....	....	3,930
Stormont, Ut	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Yellow Jacket, Nev	.....	.....	.....	.....	7.63	7.50	8.75	8.50	.....	.....	.....	.....	400
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	July 9.		July 11.		July 12.		July 13.		July 14.		July 15.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Alta, Nev	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Amador, Cal	1.15	.....	1.15	.....	1.20	1.15	1.25	1.20	1.25	.....	1.25	....	5,900
Am. Flag, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Barcelona, Nev	.35	.34	.35	.....	.35	.33	.....	.....	.40	.38	.40	.38	7,600
Bechtel Con., Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Best & B'licher, Nev	.....	.....	.....	.....	7.50	.....	.....	.....	8.75	.....	.....	.....	200
Big Pittsb'g, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Brunswick	1.55	1.50	1.55	1.50	1.55	.....	1.55	1.50	1.55	.....	1.55	...	14,800
Bullion, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Castle Creek, Id	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Central Ariz., Ariz	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Columbia & Beaver	.03	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	900
Cons. Imperial, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Con. Pacific, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Decatur, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Durango, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Eastern Oregon	.03	.....	.....	.....	.....	.....	.04	.03	.03	.....	.03	.....	8,200
El Cristo, U. S. Col	5.12	4.95	5.12	4.90	5.50	5.00	5.50	5.25	5.63	5.25	5.63	.....	7,650
Gold Placer, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hortense	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Julia, Nev	.....	.....	.70	.....	.85	.....	.85	.....	1.10	.....	.80	.....	1,000
Justice, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kossuth, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.08	.....	200
Lacrosse, Colo	.....	.....	.12	.....	.....	.....	.....	.....	.....	.....	.....	.....	100
Mexican, Nev	.....	.....	4.60	.....	.....	.....	.....	.....	5.00	.....	.....	.....	300
Middle Bar, Cal	.75	.....	.69	.....	.69	.....	.69	.....	.69	.....	.69	.....	11,300
Mono	.....	.....	.....	.....	.....	.....	.....	.....	2.65	.....	.....	.....	400
New Pittsb'g, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
North Stand'd, Cal	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. Horn-Silv'r, Ut	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oneida Chief	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ori'nt'l & Mil'r, Nev	2.15	....	2.10	2.00	2.05	2.00	2.00	....	2.10	2.00	2.05	1.90	11,200
Phœnix of Arkan's	1.30	1.20	1.25	1.15	1.20	1.15	1.30	1.05	1.10	1.00	1.10	1.05	8,100
Phœnix of Arizona	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Potosi, Nev	.20	.....	.21	....	.20	.19	.21	.19	.21	.20	.21	....	9,950
Rappahann'k, Va	.....	.....	.....	.....	.03	.....	.....	.....	.....	.....	.....	.....	300
Red Elephant, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Renfrew, N. S	1.50	....	1.50	.....	.....	.....	.....	.....	1.40	.....	1.40	.....	1,100
Saint Kevin, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
San Sebastian	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Santiago, U. S. Col	3.40	.....	3.40	.....	3.45	3.40	3.50	....	3.50	....	3.45	3.15	4,700
Security, Colo	6.37	6.00	6.37	5.50	6.25	5.87	6.00	5.00	6.25	5.50	6.00	5.25	23,180
Silver Cliff, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Silver Leaf	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Silver Queen, Ariz	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.03	....	1,000
Stanislaus, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
State L'e, 1&4, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
" Nos. 2 & 3, Nev	.....	.....	.05	.....	.....	.....	.....	.....	.....	.....	.....	.....	300
Sutro Tunnel, Nev	.35	.33	.26	.35	.37	.34	.41	.37	.43	.39	.43	.38	140,630
Taylor Plumas, Cal	.....	.....	.03	.....	.....	.....	.....	.....	.08	.06	.....	.....	5,800
Tornado	.95	.92	.98	.93	.99	.98	.99	.98	.99	.98	.99	.98	23,400
Union Cons., Nev	....	....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* Dealt in at the New York Stock Exchange Unlisted Securities.

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY.	July 8.		July 9.		July 11.		July 12.		July 13.		July 14.		SALES.
Atlantic, Mich	.....	.....	9.00	.....	.....	.....	10.00	.....	10.50	.....	10.50	.....	315
Bodie, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bonanza D	1.37	.....	.....	.....	.....	.....	.....	.....	1.37	.....	1.25	.....	550
Boston & Mont., Mont	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Breece, Colo	.48	.....	.....	.....	.48	.....	.48	.....	.....	.....	.....	.....	500
Calumet & Hecla, Mich	.....	.....	.....	.....	213	212½	212½	.....	.....	.....	215½	.....	24
Catalpa, Colo	.27	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	200
Central, Mich	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chrysolite, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Con. Virginia, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dunkin, Colo	.40	.....	.42	.40	.42	.....	.42	.....	.42	.....	.42	.....	2,300
Eureka, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Franklin, Mich	10.50	.....	.....	.....	.....	.....	10.75	....	11.75	.....	11.50	11.00	227
Freeland, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Helena, Mont	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Honorine, Utah	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ironton Iron Co., Mich	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Napa, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Osceola, Mich	29.87	29.50	29.50	.....	28.50	.....	30.00	28.50	29.00	.....	29.75	29.00	912
Pewabic, Mich	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Quincy, Mich	....	.....	.....	.....	.....	.....	.....	.....	53.50	.....	53.50	52.75	141
Ridge, Mich	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Robinson, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Silver King, Ariz	.....	.....	9.50	9.37	.....	.....	.....	.....	.....	.....	.....	.....	35
Standard, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Stormont, Utah	.....	.....	.....	.....	.10	.....	.10	.....	.....	.....	.....	.....	400
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

NAME OF COMPANY.	July 8.		July 9.		July 11.		July 12.		July 13.		July 14.		SALES.
Allouez, Mich	.....	.....	1.13	.....	.....	.....	1.03	.....	1.03	.....	1.50	.....	350
Arnold, Mich	.....	.....	.....	.....	.35	.....	.....	.....	.....	.....	.....	.....	100
Aztec	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.06	.....	100
Blue Ridge, Mich	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bowman Silv'r, Nev	.....	.....	.....	.....	.....	.....	.03	.....	.03	.....	.03	.....	1,500
Brunswi'k	1.50	1.47	1.55	1.50	.....	.....	1.52	1.50	1.55	1.50	1.55	1.47	2,700
Contentment	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Con. Pacific, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Crescent, Colo	.12	.....	.....	.....	.12	.....	.11	.....	.....	.....	.....	.....	1,100
Cusi, N. Mex	.12	.....	.12	.....	.12	.....	.....	.....	.....	.....	.....	.....	500
Decatur, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Empire, Utah	.....	.....	.07	.....	.07	.....	.....	.....	.....	.....	.....	.....	1,000
Fern	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Humboldt	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Huron, Mich	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.25	.....	100
Kearsarge, Mich	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mesnard, Mich	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mono, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
National, Mich	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Native, Mich	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oriental & M., Nev	.....	.....	.20	.....	.21	.....	.21	.20	.20	.....	.20	.....	2,700
Phœnix, Ariz	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rappahannock, Va	.20	.....	.20	.....	.21	.....	.....	.....	.21	.20	.21	.....	2,200
Security, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Side	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sutro Tunnel, Nev	.38	.36	.34	.30	.34	.....	.....	.....	.34	.....	.39	.33	2,075
Tamarack, Mich	.....	.....	.....	.....	90	.....	.93	.....	.93	.....	.....	.....	91

New York: Dividend shares sold, 24,535. Non-dividend shares sold, 289,210. Total New York, 313,745.
Boston: Dividend shares sold, 5,604. Non-dividend shares sold, 14,516. Total Boston, 20,120.

COAL STOCKS.

NAME OF COMPANY.	Par value of shares.	July 9.		July 11.		July 12.		July 13.		July 14.		July 15.		Sales.
		H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Barclay Coal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cameron Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Col., C. & I	100	44¼	43½	44¾	44	43⅞	43	43¾	43	44	41½	44¾	44¼	4,057
Ches. & O. RR	100	.....	.....	7¼	7	7	.....	7	6⅝	.....	.....	.....	.....	311
*Chic. & Ind. Coal RR	....	.....	.....	.....	.....	.....	.....	53	.....	.....	.....	.....	.....	100
Do. pref	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Col. & Hocking Coal	.....	.....	.....	38	37	37¼	37	37⅛	36⅝	36⅛	35½	.....	.....	1,800
Consol. Coal	100	23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	100
Cumb. C. & I	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Del. & H. C	100	101⅛	100	101¼	100⅞	101⅛	101	102	100⅛	101	100	101⅜	101¼	5,349
D., L. & W. RR	50	132	130¾	132¼	131⅜	132⅜	131½	131⅝	130¼	131⅝	130	132	131½	81,336
Elk Lick Coal Co	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hocking Valley	100	28¼	.....	29	28¾	29	28½	.....	.....	28⅛	27½	29½	29	3,025
Lehigh C. & N.†	50	49¼	.....	49½	49⅜	49⅝	49½	49⅝	49⅛	49½	49¼	.....	.....	778
Lehigh Valley RR.†	50	.....	.....	57¼	57⅛	57½	.....	57¼	57⅛	57⅝	57¼	.....	.....	906
L. & W. C. & I. Co	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Maryland Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Marshall Con. Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	22	.....	100
Montauk Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Morris & Essex	50	137	.....	138¼	.....	137	.....	137	.....	.....	.....	.....	.....	210
New Central Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. J. C. RR	100	.....	.....	79⅛	78¾	78⅝	....	78½	76½	76⅝	74½	77⅞	77⅛	11,765
N. Y. & S. Coal	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. Y., Susq. & Western	100	10	9⅞	10½	10¼	.....	.....	10	.....	10	9¾	10⅜	10¼	1,180
Do. pref	100	31¾	31	31¾	31¾	32	31½	32	31	31½	30½	32½	32⅛	3,945
N. Y. & Perry C. & I	100	69⅝	69½	69¾	.....	.....	.....	49	.....	50	49½	50½	50¼	800
Norfolk & Western R R.	100	.....	.....	.....	.....	.....	.....	18½	18	.....	.....	18¼	.....	445
Do. pref	100	46½	46	46½	46⅛	46⅛	45½	45¼	45	45⅛	44½	46	45⅛	4,520
Penn. Coal	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Penn. RR †	50	56	55⅞	56⅛	55⅞	56	55⅞	55⅝	55⅜	55¾	55½	.....	.....	3,995
Ph. & R. RR.**	50	56½	55⅝	56⅞	56	56¾	56	56⅛	54⅝	55½	54	56⅛	55¼	264,017
Spring Mountain	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tennessee C. & I. Co	100	31	.....	32	31½	31½	30½	31	.....	33¼	31	35¼	34⅝	5,215
Westmoreland Coal†	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

** Of the sales of this stock, 40,092 were in Philadelphia, and 223,925 in New York.
† The quotations for these stocks are not percentage, but actual price.
* Dealt in at the New York Stock Exchange, Unlisted Securities.

Total sales, 393,954.

San Francisco Mining Stock Quotations.

COMPANY.	CLOSING QUOTATIONS. July 8.	July 9.	July 11.	July 12.	July 13.	July 14.
Albion	.....	.....	.....	.....	.....	.....
Alpha	.....	.....	.....	.....	.....	.....
Alta	2⅛	2⅛	2½	2¾	2¾	2½
Argenta	.....	.....	.....	.....	.....	.....
Bechtel	.....	.....	.....	.....	.....	.....
Belcher	.....	.....	.....	.....	.....	.....
Belle Isle	.....	.....	.....	.....	.....	.....
Best & Belcher	7¼	7¼	7½	8⅛	8⅛	7½
Bodie	2¾	2¾	2¾	2⅞	2⅞	2⅞
Bulwer	1	.95	1	1	1	1⅛
Challar	7⅝	7¾	8⅜	9¼	9¼	8⅛
Con. Cal. & Va.	21¾	22¼	21¼	22	22	21¾
Con. Pacific	20	.....	.....	.....	.....	.....
Crown Point	12½	14½	14⅝	16⅞	16⅞	14⅛
Eureka Cons	5½	.....	5¾	.....	.....	.....
Gould & Curry	4¼	4¼	4½	5⅝	5⅝	4⅞
Grand Prize	.....	.....	.....	.....	.....	.....
Hale & Norcross	5⅛	5⅝	5⅝	6⅛	6⅛	5⅝
Martin White	.....	.....	.....	.....	.....	.....
Mexican	4⅝	4¾	4¾	5⅝	5⅝	4⅞
Mono	2¾	2⅞	2¾	2⅝	2⅝	2⅝
Mount Diablo	.....	.....	.....	.....	.....	3¾
Navajo	1⅜	.....	1⅜	1½	1½	1⅜
Ophir	9½	8⅝	8⅝	9¾	9¾	8⅝
Potosi	7⅝	7⅝	8	9	9	7⅝
Savage	6¼	6½	6⅞	7⅝	7⅝	6⅝
Scorpion	.....	.....	.....	.....	.....	.....
Sierra Nevada	4⅝	4¾	4⅝	5⅜	5⅜	4¾
Sutro Tunnel	.....	.....	.....	.....	.....	.....
Tip Top	.....	.....	.....	.....	.....	.....
Union Cons	3⅝	3⅝	3¾	4⅛	4⅛	3⅞
Utah	1¾	1⅞	2	2¼	2¼	2⅛
Yellow Jacket	.....	7¼	7¼	8½	8½	7⅝

California & Virginia. It is stated that the fire in the mine has been extinguished and that great developments in this company's property may now be looked for. The usual monthly dividend of $108,000 has been declared. The stock has been selling at from $20.75 to $23.25, and at $22.25 to-day. Crown Point, which was selling at $9 last week, advanced from $16.50 to $18; on Wednesday. Hale & Norcross declined from $6 to $5.50; Ophir from $9.63 to $9; Chollar from $9 to $8.75. Best & Belcher advanced from $7.50 to $8.75; Savage from $6.87 to $7.50; Mexican from $4.60 to $5; Julia from 70c.@$1.10; Yellow Jacket from $7.50 to $8.50; Belcher sold at $12.25.

But little interest was shown in Navajo at $1.35. Belle Isle declined from $1.35 to $1.10.

Alice shows sales of 400 shares at from $1.20 down to $1.

Ontario holds its own at $26.

Horn-Silver is neglected, and shows no life at from 95c.@$1.

Helena, which rarely appears on the list, shows a sale at $1.15.

Holyoke remains at from 12@14c.

Silver King is steady at from $8@$8.50.

Phœnix, of Arizona, which sold at higher prices the beginning of the week, declined toward the close, going from $1.30@$1, and selling to-day at from $1.05@$1.10.

Rappahannock has failed to move up with the expected speed, and all that can be said is that the stock "holds its own" as well as the rest of the list. President Macpherson returned from the mine this week after a careful inspection of the property, which he reports in excellent condition. Should the general market show much of an advance there is little doubt that Rappahannock will move up in sympathy. The price of the stock has ruled at from 19c. to 21c.

Deadwood-Terra, since it has again entered the list of dividend paying mines, has been active, showing transactions at from $2.20 to $2.75, selling to-day at $2.50. Homestake declined from $15.12 to $14.75. Father de Smet is again awake, and has been going from 70c. to 55c.

Outside of Security little attention is shown to Colorado stocks. Chrysolite shows a sale at 50@52c., Leadville at 53c., Little Chief at 30@31c., and Robinson at 35c.

The Amador *Ledger* states that the manipulators of Middle Bar and Amador are about bringing out some properties lying within a short distance of the Middle Bar mine at Jackson, Cal. These incorporations are named the Grenoble, the Astoria, and Hollywood mining companies. The first named was formerly known as the Wetzlar mine, the two last named are new locations with no developments to speak of. There is every reason to believe that these properties are under the control of the adroit managers of the Amador and Middle Bar claims, and we desire to sound a note of warning in advance. The three new candidates for popular support are not developed properties. The Grenoble has been prospected to some extent, and small pockets of gold-bearing quartz has been taken out, but nothing to justify confidence in it as a profitable mine. It is in a region where pockets have been the rule, and permanent paying ledges the exception. A claim of this nature is just the thing to create a temporary flurry on a market distant from the scene of operations, and where the real facts can not readily be ascertained. As regards the Astoria and Hollywood, they are mere locations, and nothing whatever can be said as to their prospects for developing into mines.

We have received reliable information from a correspondent relating to the "Twin Brothers," Amador, and Middle Bar which will be of interest to many of our readers. The "Amador" had reached a depth of 120 feet in April last, but had at that time run no drifts or crosscuts, there was and is no vein in the shaft. It is some 200 feet or more to the east of what is known as the Mother Lode, and it is problematical whether, within the boundaries of their claim, they will find any lode at all. The parties who are working the property have of course the native American right to *hunt for ore* wherever they can induce people to purchase ground and equip it with a plant. The present hoisting-works is a small one, and could have been put up, I think, at a cost not exceeding say $1500 to $2000. The owners claim to have at command some 400,000 tons of tailings that can be milled at a small profit. They must refer to the tailings from old gravel workings covering a large area of ground in the vicinity of the "Amador" claim, and which are probably quite worthless and have been drawn upon for years to fill up and repair the country roads.

"The Middle Bar" property has more to offer for the claims made for it. The shaft is 60 feet deep, and has a vein of auriferous quartz and pyrites from 2 feet to 5 feet in width; in places, now and then, a little free gold can be seen in the rock. It is situated on the auiferous zone, on "Mother Lode." Its plant is very small; a horse whim and blacksmith shed; the whole could probably be put up for say $300. The transactions in these stocks still continue, but it is said that it would be as difficult to discover a bona fide holder of either stock as it is apparently to find a paying vein in either mine. All of which goes to show that the manipulators of the stock are the sole owners, and that the alleged daily transactions exist merely on paper. The manipulators here let Amador show an advance from $1.15@$1.20, and Middle Bar a decline from 75@69c.

Brunswick is quiet, and the price remains at from $1.50 to $1.55. The reports from the mine continue to be encouraging. Stanislaus, which during the last few weeks has shown a continued decline, did not appear on the market this week. Among the Bodies, Standard attracted the most attention, advancing from $1.20 to $1.80. Bodie was quiet at from $2.70 to $2.90, Bulwer at from 90c. to $1, and Mono at $2.65. Plymouth Consolidated has increased its dividend from 25@40c. per share. The semi-annual report just published in our Mining News shows a large bullion production. The company has no debts and a good amount of cash on hand. Under these favorable reports the stock advanced from $20.50@$21.87. Taylor Plumas shows some life and went from 3@8c.

Auction Sale of Stocks.

The following securities were sold at auction in this city on the 13th inst.: 100 shares Pennsylvania Coal Company, 265; 200 shares Utica, Chenango & Susquehanna Valley Railroad, guaranteed by Delaware, Lackawanna & Western Railway, 119⅛ to 119⅝; $10,000 Chataugay Ore and Iron Company first mortgage 6 per cent bonds, due 1915, 100; 12 shares Standard Oil Trust, 185¼.

Assessments.

COMPANY.	No.	When levied.	Delinquent in office.	Day of sale.	Amount.
Adelphia, Dak.	3	July 1	Aug. 2	Aug. 18	.01
Best & Belcher, Nev	37	June 3	July 8	Aug. 2	.50
Big Hole Placer, Utah	1	June 20	July 20	Aug. 6	.01
Bulwer	3	July 7	Aug. 16	Sept 21	.20
Courier, Idaho	....	June 15	Sept. 8	Sept. 27	.05
Challenge, Cal.	3	May 26	June 28	July 18	.30
Eldorado, Dak.	2	June 14	July 14	July 30	¼
Exchequer, Nev.	24	July 6	Aug. 15	Sept. 6	.20
General Sturgis, Dak	....	June 7	July 9	July 25	.002
Gould & Curry, Nev.	56	June 3	July 8	Aug. 2	.50
Hale & Norcross, Nev	94	July 7	Aug. 10	Aug 31	.50
Heath, Id.	1	May 20	June 30	July 25	.15
Homew'd B'nd, Dak.	4	May 16	*J'y 17	*Aug 16	¼
Jefferson, Dak.	....	May 5	June 30	July 21	.01
King of the West, Id.	1	May 31	July 5	July 25	.15
Live Oak Drift, Cal.	....	June 24	July 20	....	.05
Locomotive, Ariz.	1	June 1	July 1	July 20	.25
Manhattan, Nev.	6	June 1	July 1	July 21	1.00
Mayfl'wer Gravel, Cal	36	June 2	July 6	July 29	.25
Mexican, Nev.	34	July 6	Aug. 10	Aug. 30	.25
Mocking Bird, Cal.	....	June 24	July 16	....	.10
Morning Star, Nev.	2	July 6	Aug. 11	Aug. 30	.15
Morrell Cons., Cal.	2	May 31	July 2	July 20	.03
Occidental, Nev	9	June 24	July 28	Aug. 22	.50
Packer Lake, Cal	1	June 26	July 25	Aug. 15	.00½
Pilot Peak, Cal.	15	May 7	June 20	July 18	¾
P. J. Keyes, Nev.	1	June 21	July 26	Aug. 16	.25
Savage, Nev.	68	July 7	Aug. 9	Aug. 29	.50
Seabury Calkins, Dak	6	June 7	July 9	July 25	.01

* The delinquent day and the day of sale were postponed to dates given above.

Dividends.

Big Bend Hydraulic Company, of Dakota, has declared a dividend, No. 42, of three cents per share, or $6000, payable on the 20th inst., at No. 181 Broadway, New York City.

Chartiers Valley Gas Company, of Pennsylvania, has declared a dividend, No. 3, of two and one half per cent, payable July 28th, at the Hamilton Building, Fifth avenue, Pittsburg, Pa.

Colorado Central Consolidated Mining Company, of Colorado, has declared a dividend, No. 17, of five cents per share, or $13,750, payable Aug. 10th, at the Farmers' Loan and Trust Company, New York City.

Consolidated California & Virginia Mining Company of Nevada has declared a dividend, No. 8, of fifty cents per share, or $108,000, payable July 7th at San Francisco.

Philadelphia (Natural Gas) Company, of Pennsylvania, has declared a dividend, No. 21, of one per cent, or $75,000, payable July 20th, at No. 935 Pine avenue, Pittsburg, Pa.

Plymouth Consolidated Gold Mining Company of California has declared a dividend, No. 51, of forty cents per share, or $40,000, payable August 5th at 23 Nassau street, New York City.

Quicksilver Mining Company of California has declared a dividend of one dollar and a half per share, or $64,500, payable August 15th at No. 20 Nassau street, New York City.

Silver King Mining Company of Arizonia has declared a dividend, No. 69, of twenty-five cents per share, or $25,000, payable July 15th at San Francisco.

Sterling Gold Mines, Montana, has declared an interim dividend for the six months ending May 31st of five per cent per annum, free of income tax.

Pipe Line Certificates.

Messrs. Watson & Gibson, brokers, 49 Broadway, report for the week as follows:

Oil closed to-day at 60, the lowest closing for some time. It sold as low as 59⅛, but rallied one cent. The Washington and Taylorstown fields hold up remarkably well, and as the public are indisposed to buy, and as it can hardly be the policy of the Standard to bull crude oil, we believe lower prices are inevitable.

The following table gives the quotations and sales at the Consolidated Stock and Petroleum Exchange:

		Opening.	Highest.	Lowest.	Closing.	Sales.
July	9	60⅜c.	60⅞c.	60¼c.	60⅞c.	180,000
	11	60¾	61¼	60¾	60⅞	299,000
	12	60⅞	61	60⅛	60⅝	290,000
	13	60⅝	60¾	60⅛	60⅛	447,000
	14	60⅛	60⅞	60⅛	60¾	494 000
	15	60¼	60¾	59⅛	60	1,413,000
Total sales in barrels						3,123,000

Baltimore Stock Quotations.

COMPANY.	Bid.	Asked.
Atlantic Coal	$1.40	$1.60
Baltimore & N. Carolina	.50@ .60	.70
Big Vein Coal	....	1.25
Conrad Hill	.10	.20@ .25
Diamond Tunnel	.50	.60
George's Creek Coal	79.00@80.00	83.00@85.00
Lake Chrome	.12	12@ .15
North State (Balt.)	.50@ .72	.65@ .75
Ore Knob	.10	.12@ .13
Silver Valley	$1.70@$1.75	1.80@ 2.00

Highest and lowest prices bid and asked during the week ended July 14th.

Birmingham, Ala., Stock Quotations.

Company.	Bid.	Asked.
Alabama Connellsville C. & C.	....	100
Decatur Land & Imp. Co.	23¾@28	24¾@ 29
Decatur Mineral Land Co.	19@20	....
Debardleben C. & I. Co.	....	‡75
Enterprise Mfg. Co.	....	100
* Sloss Iron & Steel Co	....	90½
Sheffield Coal & Iron Co.	95@105	104¼@105½
Tuscaloosa C. & I. Co., paid.	....	‡90@100
† Tuscaloosa C. & I. Co.	....	30

* Bonds. † Forty per cent paid. ‡ At seller's option for 6 days.

Highest and lowest prices bid and asked during the week ended July 12th.

Boston Mining Stocks. July 14.

From our Special Correspondent.]

Since our last report there has been a steady improvement in the market for the leading copper stocks, and the outlook is decidedly more favorable for a good degree of activity in this class of stocks as soon as the money market eases up. Ingot copper has advanced to 10½c., and this fact alone is a powerful factor for an advance in stocks, while holders are not anxious to part with them at prices which have ruled current the past six months, but confidently look forward to much higher prices in the near future. Calumet & Hecla has been very strong and in steady demand at $212@$215½, the highest price being paid to-day for it.

Quincy has advanced from $50 to $53½, but even at these figures very little stock comes out.

Franklin feels the improvement as well, and justifies our prediction, showing an advance from $10¼ to $11⅝.

Osceola has been active, and touched $30, a gain of $2, but did not hold it, owing to considerable stock offering, and declined to $29, making a net gain of $1.

Atlantic advanced from $9 to $10½, on sales of about 400 shares.

Tamarack records the greatest advance of any of the list, from $85 to $93, and not much stock offering at this price. Huron sold at 3¼c. The speculative list also feels the improvement, and although there is nothing doing in them as yet, there is more inquiry, and better prices are bid without bringing them to the surface. At the Mining Exchange, there is only a fair amount of business transacted, mining stocks, as a rule, being dull and inactive, without much change in prices.

Deadwood-Dakota Mining Stocks.

Company:	H.	L.	Company:	H.	L.
Bullion	.05	.03½	Pocahontas	.02½	.01½
Centre Shot	.02½	.01½	Rattler	.20	.10
Eureka	.05	.05	Ruby Bell	.02½	.02½
Enterprise	.02	.01½	Seabury Calkins	.14	.03
Hester A	.09	.07¾	Seg. Iron Hill	.08	.08
Iron Hill	1.55	1.45	Silver Ridge	.01½	.01½
Jefferson	.10	.10	Spanish R	.10	.08½
Minna	.02	.02	U. S. Grant	.02	.01
Mugwump	.02	.02			

Highest and lowest prices bid and asked during the week ended July 9th.

Gogebic Iron Stocks.

Shipments of iron ore from Ashland, Wis., the mines of the Gogebic District, for the season, up to and including July 6th, are as follows:

	Tons.		Tons.
Ashland	52,243	Norrie East	1,533
Aurora	20,893	Norrie	49,325
Brotherton	3,300	Odanah	6,261
Colby North	25,952	Pabst	7,165
Colby South	51,308	Pence	1,457
Germania	15,013	Puritan	8,878
Iron King	12,839	Sunday Lake	1,084
Ironton	9,448	Superior	8,869
Kakagon	11,464	Vaughn	2,101
Montreal	5,479		
Nimikon	6,387	Total tons	301,003

The shipments show an increase of 116,042 tons this year, as compared with the shipments made at the same time last year.

An official statement of the earnings of the entire line of the Wisconsin Central Railroad for the first six months of the current year shows for ore alone $18,948.83. Of these earnings $7800 was from freight from the mines to Ashland, Wis.

The consolidating movement appears to be going on. It is now suggested that the Burton mines may be consolidated into one concern, if not absorbed by the Moore—Benjamin consolidation. Stocks are advanced in some cases and decline in others, those affected by